

Traffic Quality on the Atlanta Regional Highway Network

VOLUME ONE: FREEWAYS (2010)

Prepared for
The Georgia Department of Transportation
by Skycomp, Inc. (Columbia, Maryland)

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DRAFT REPORT

The contents in this publication reflect the views of the Author(s), who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Georgia Department of Transportation or the Federal Highway Administration. This publication does not constitute a standard, specification or regulation.

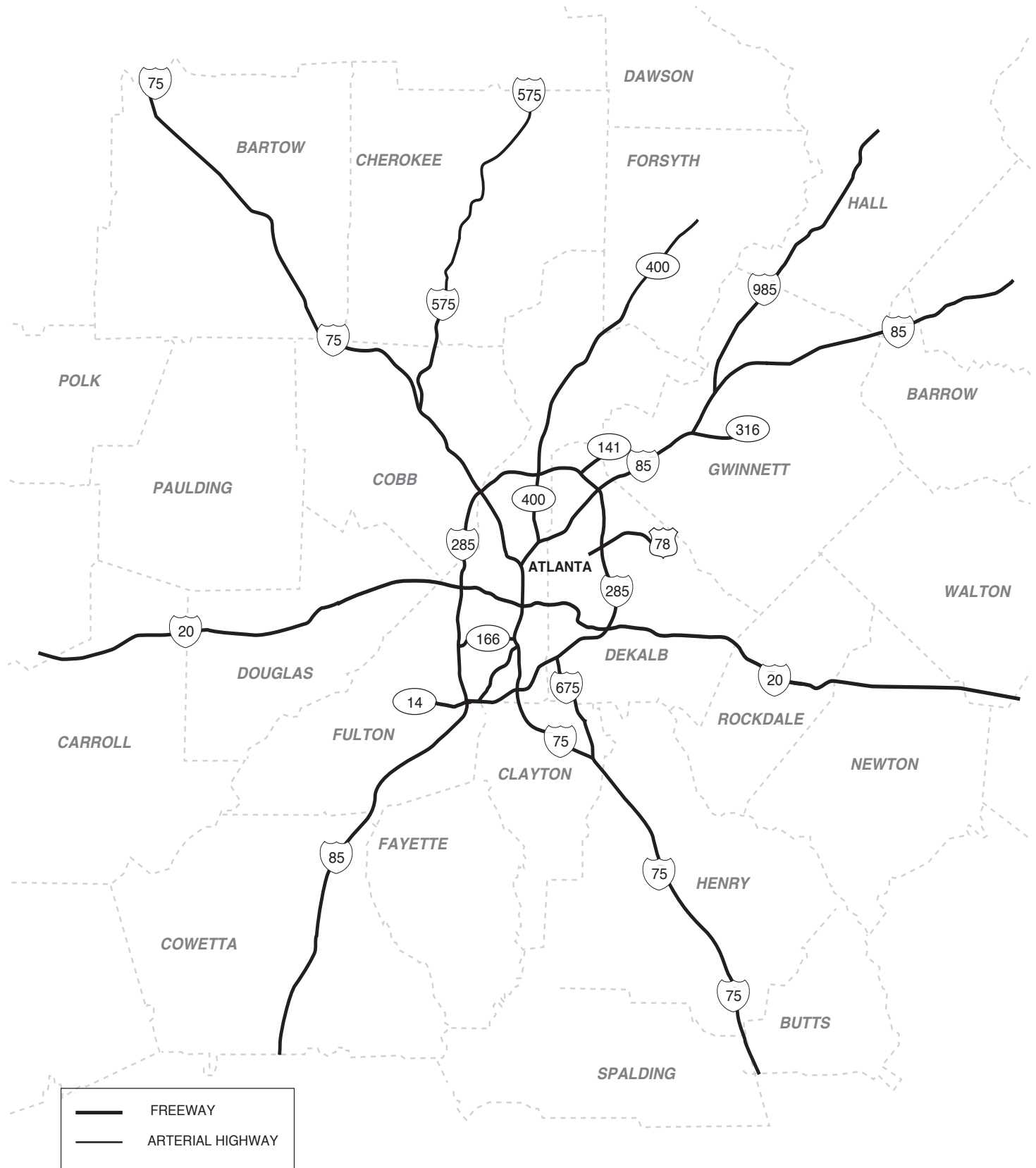


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Freeway Network

Fall 2010



INTRODUCTION

The purpose of this aerial survey program is to rate the performance of the regional Atlanta highway system on a recurring basis, and to provide related data to regional planners, stakeholders, and decision-makers. This mobility-monitoring program began in the fall of 1998, at which time approximately 500 centerline miles of limited-access and arterial highway in the Atlanta metropolitan area were surveyed (data collection occurred during both morning and evening peak commuter periods). Coverage was repeated three years later, in the fall of 2001, leading to an identification of locations experiencing both improved and degraded mobility.

The early success of this survey program resulted in decisions to expand coverage out to the boundaries of the larger (21-county) Atlanta planning region. Extending the boundaries of the survey region involved approximately 250 miles of freeways that had not yet been surveyed. In the spring of 2002, these extended segments were photographed, utilizing the same methodology of the previous surveys.

In the spring of 2004, the scope of coverage was extended further to include an additional 1,500 miles of high-volume signalized arterial highways from throughout the 21-county planning area. This regional arterial network, together with the extended primary network, forms the backbone of the region's state highway transportation system.

In the fall of 2005, the extended highway segments from 2002 were added to the original segments from 1998 and 2001, and the combined network (approximately 750 miles) was surveyed once again.

Survey coverage of the entire system (approximately 2250 miles) was repeated in the fall of 2007 and the spring of 2008. During the spring and fall of 2010 the entire system was surveyed once again, this time covering 2650 miles of highways in the Atlanta metropolitan area (approximately 400 miles of highway was added to the system in 2010).

The aerial survey methodology takes advantage of the mobility and vantage point of fixed-wing aircraft, permitting data collection across a vast highway network that could not be affordably accomplished using traditional ground-based survey methods. During each survey period, up to twenty aircraft at a time followed designated routes along the primary highways; each highway segment is photographed in its entirety approximately 24 times. Performance ratings derived from the photography are presented in this report in graphical format.

For the purpose of presentation in a logical format, the findings of the 2010 survey iteration have been grouped into two volumes: *Volume One* presents all findings related to the freeway system. *Volume Two* presents all findings related to signalized (interrupted-flow) arterial state highways.

FEATURES OF THE AERIAL SURVEY PROGRAM

During this aerial survey program, overlapping photographic coverage was obtained for each designated highway, repeated once an hour over four mornings and four evening commuter periods. The morning coverage time was 6:30-9:30 a.m., and the evening time was 4:00-7:00 p.m. Survey flights were conducted on weekdays, excluding Monday mornings, Friday evenings and mornings after holidays. Data were extracted from the aerial photographs to measure average recurring daily traffic conditions by link and by time period. Features of the aerial survey program include:

1) Report of findings: Highway Performance Rating Tables. Volumes One and Two. 2010

Volume One presents performance-rating tables of 2010 traffic conditions on the region's freeway sub-system. The ratings are presented by highway, highway segment, direction, and time period. For these uninterrupted-flow facilities, the ratings are density-based level-of-service (LOS) designations "A", "B", "C", "D", "E" and "F", as defined in the 2010 Highway Capacity Manual. Details on how these level-of-service ratings were generated are provided in *Appendix A* of *Volume One*.

Volume Two presents performance-rating tables of 2010 traffic conditions on the backbone of the region's signalized arterial sub-system. For these interrupted-flow facilities, a surrogate level-of-service measure has been used, based on the size of vehicle platoons and the degree of queuing at signalized intersections. Details on how these surrogate level-of-service ratings were generated are also provided in *Appendix A* of *Volume Two*.

The performance rating tables in *Volume One* and *Volume Two* also contain arrowheads that depict locations of recurring congestion; narratives that clarify the severity and frequency of the congestion accompany each arrowhead. Where evident, apparent causes of the problems are also described.

2) Special Summary Report: Mobility Assessment and Bottleneck Changes, 2010 vs. 2007/2008

The *Mobility Assessment and Bottleneck Changes Report* compares conditions found during the 2010 and 2007/2008 surveys. Previous reports compared 2008 with 2005 and 2005 with 2001. These special reports summarize the state of mobility on the network as of the current survey year; and they highlight the specific bottleneck improvements and degradations that have been documented over the course of the survey program. These reports present extended “bottleneck” and “comparative” arrowhead maps that depict the location and typical extent of congested bottlenecks. “Before” and “after” highlight aerial photographs are also provided in many cases to illustrate major changes on the system.

3) Web-Based Module for the GDOT web site

The web-based product presents data collected from all 2,650 miles of surveyed highway; this product allows data queries from each of the surveyed years, and includes thousands of highlight aerial photographs of congestion found in the region. This product also contains detailed “bottleneck” and “comparative” arrowhead maps that highlight exactly where congestion was found on the system during each survey iteration. The product can be viewed over the Internet for private or group use; the interactive feature allows a presenter to respond to audience interests by going to specific locations as appropriate. This product also supports digital downloads of all reports created over the course of this survey program. Lastly, a data extraction module allows users to create graphic displays and download performance-rating tables based on user-selected filters.

4) Survey Database

A primary deliverable for this project is the *Survey Database*, built for the *Microsoft Access*™ platform. This database contains all of the data collected from the aerial survey program, including vehicle counts and road segmentation, flight times and dates, and the highway segment measurements used to calculate freeway densities. Using this database, a number of reports can be displayed or printed, including day-by-day comparative reports, segment densities, and incident information.

5) Speed/Density Relationship on freeways

In order to allow the estimation of vehicle speeds from densities on the freeways, Skycomp has built a database from data collected in the Washington D.C. metropolitan area and other cities. This database demonstrates the relationship between traffic densities and speeds. From this database, a look-up table was developed relating the two variables. The result of Skycomp’s work is provided in *Appendix B*.

DISCLAIMER

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QUESTIONS

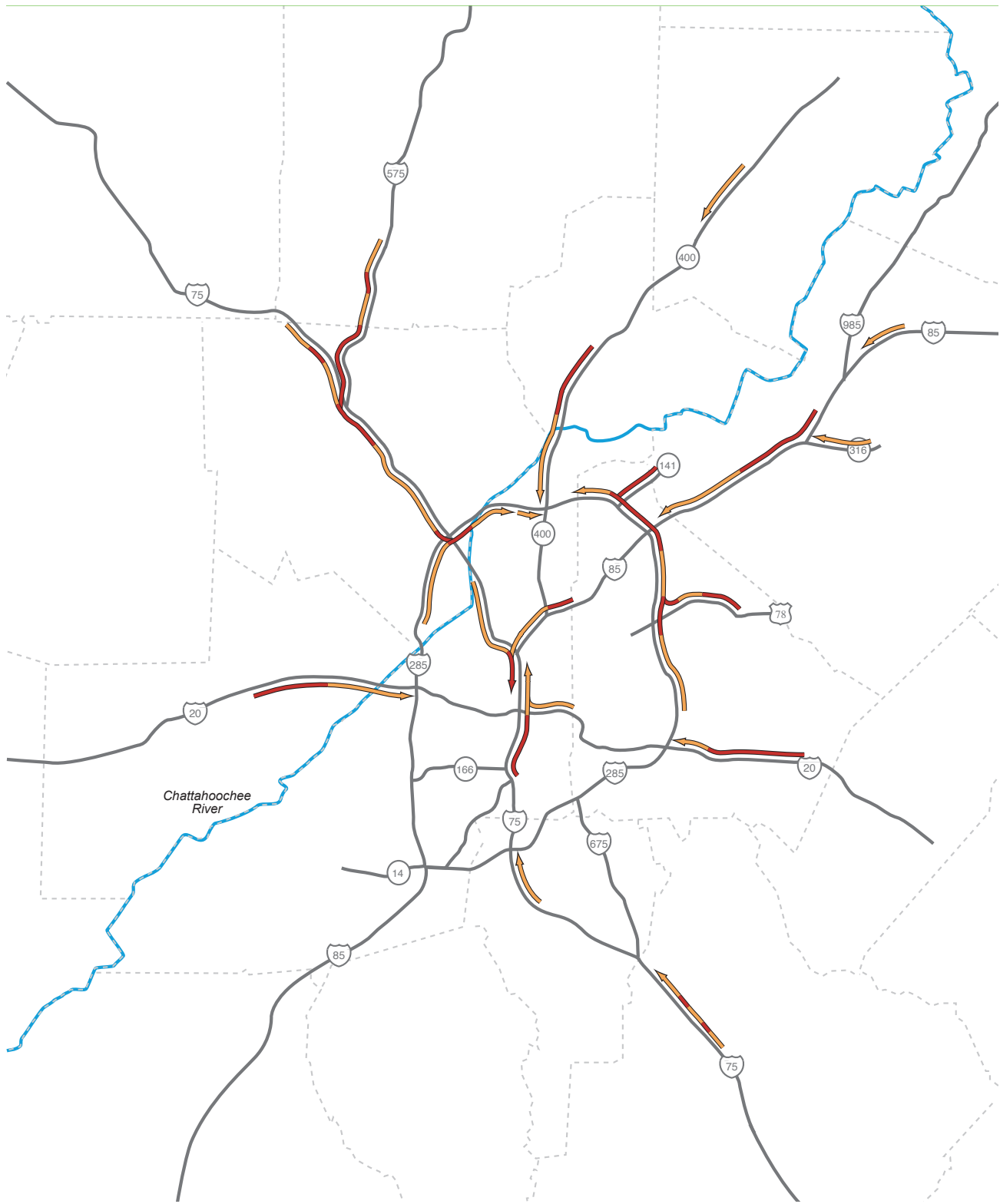
If there are any questions about this survey program or the underlying methodology, please direct them to Greg Jordan at 410-884-6900.

Part One - Regional Congestion Graphics

Morning & Evening Regional Congestion Graphics

This section of the report contains morning and evening regional graphics that depict all locations where congestion was found.

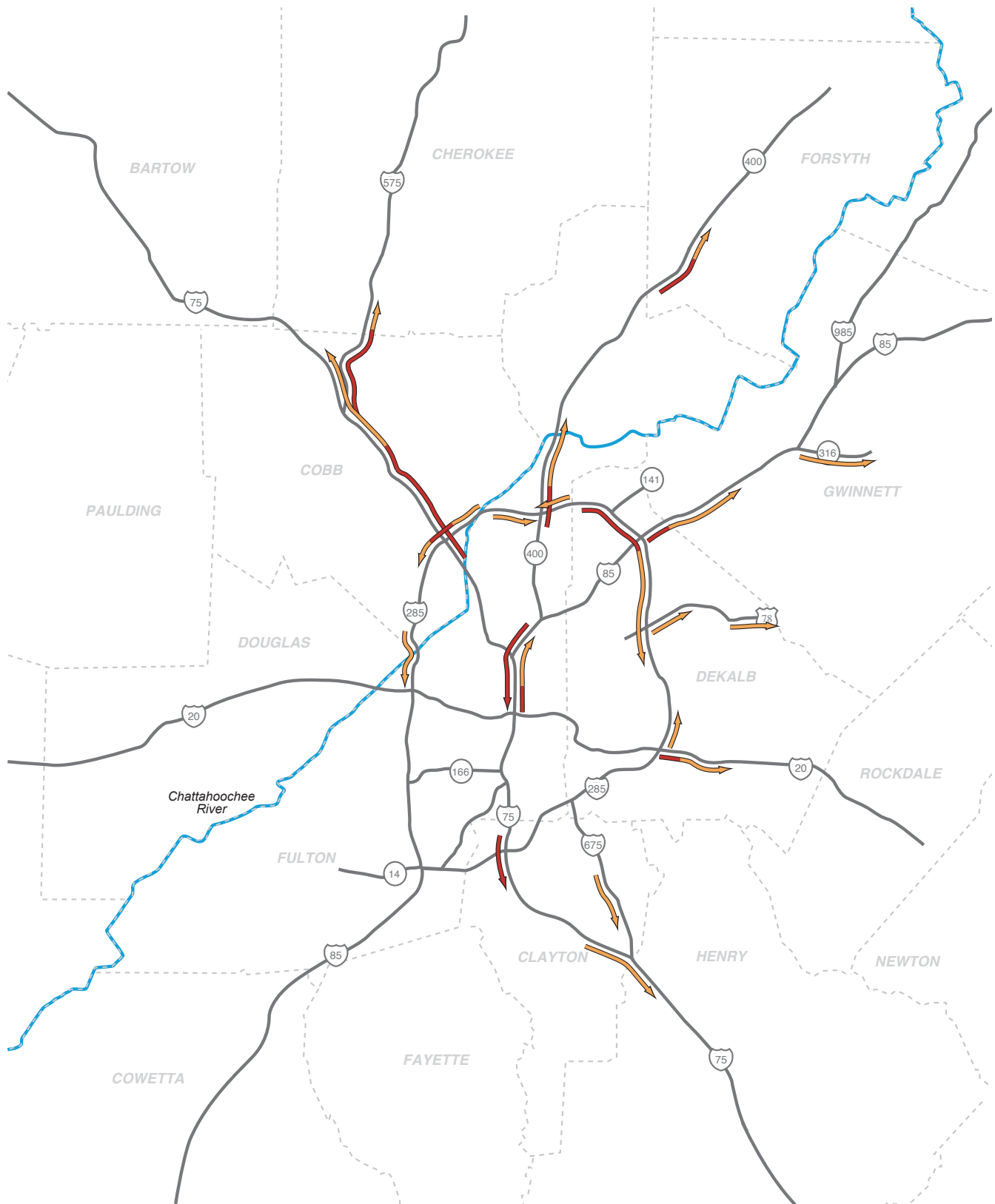
Morning Recurring Freeway Congestion (6:30 - 9:30 a.m.) 2010





Legend

- Severe mainline congestion (<30 mph)
- Moderate or intermittent mainline congestion (30-50 mph)

Evening Recurring Freeway Congestion (4:00 - 7:00 p.m.) 2010



Legend

-  Severe mainline congestion (<30 mph)
-  Moderate or intermittent mainline congestion (30-50 mph)

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Part Two - Performance Ratings (FREEWAYS)

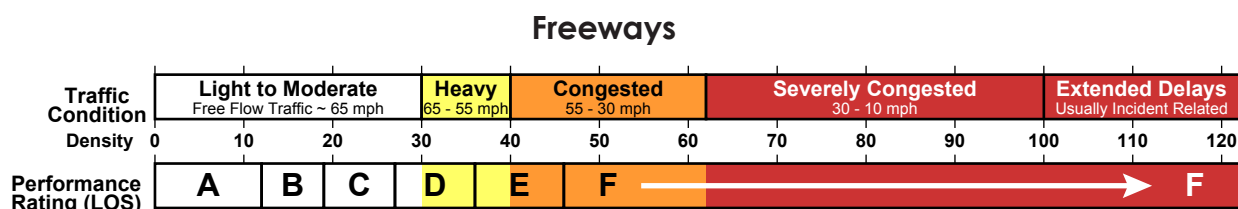
Performance Rating Tables, Fall 2010

This section of the report presents performance rating tables of 2010 traffic conditions on the region’s freeway sub-system. The ratings are presented by highway, highway segment, direction and time period. For clarification, these performance rating tables also contain arrowheads that depict the typical extent and location of recurring congestion. Details on how these level-of-service ratings were generated are provided in *Appendix A*.

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Performance Rating Descriptions: FREEWAYS

For limited access facilities, the ratings are density-based level-of-service designations “A” through “F”, as defined in the 2010 Highway Capacity Manual. A summary of density based level-of-service is provided below (a more detailed discussion of level-of-service is provided in Appendix A).



Note: In some segments congestion was not uniform, so that high densities associated with congestion were “diluted” by low densities found elsewhere in the segment or at other times. In these cases, averaged density values do not reflect the variety of conditions found in the segments. This occurrence is known as “nested congestion”. Accordingly, four types of “nested congestion” have been identified with superscripts, as follows:

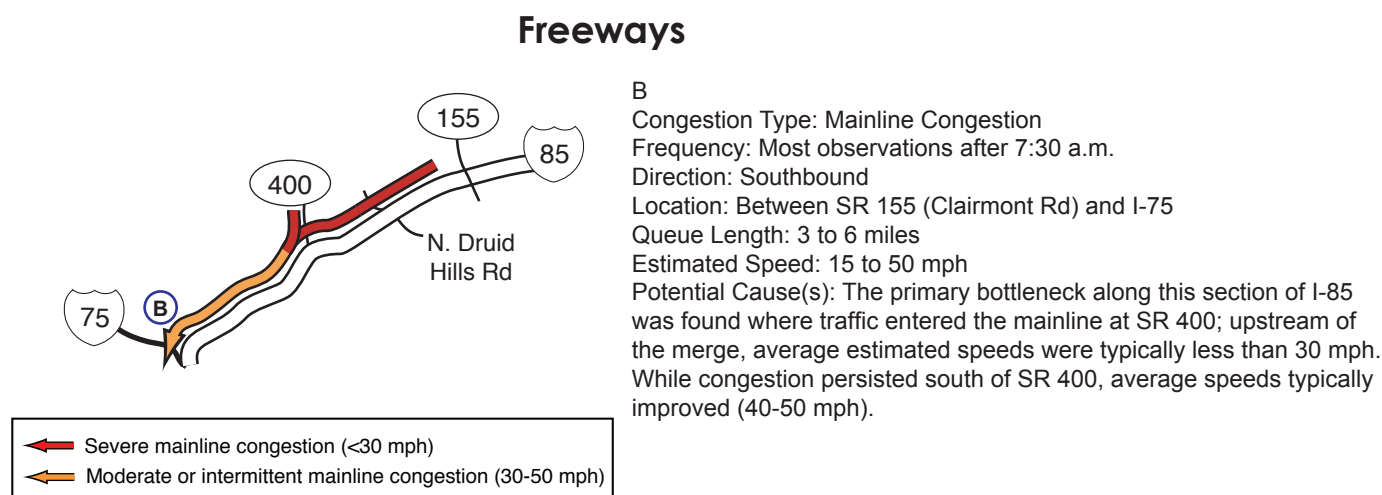
Nested congestion superscripts:



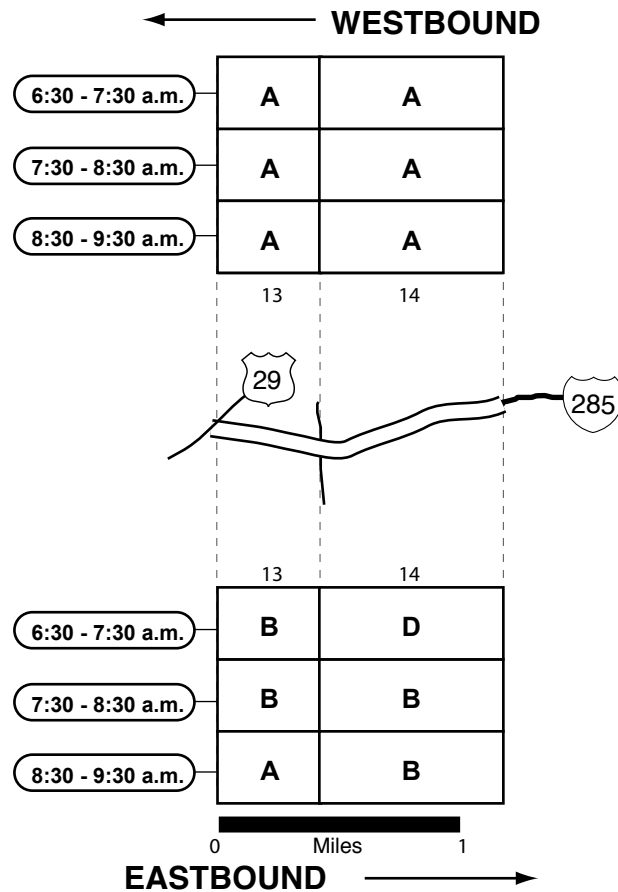
- 1 Type 1 nested congestion (some days, not others).
- 2 Type 2 nested congestion (more severe in left or right-hand lanes).
- 3 Type 3 nested congestion (present only in the first or second half-hour period).
- 4 Type 4 nested congestion (partial length of segment).

Bottleneck Graphics and Analytical Notes

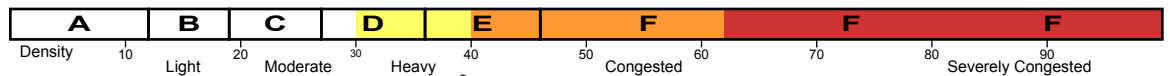
Each performance rating table includes arrowheads that depict locations where congestion was found; notes that clarify the frequency and severity of the congestion accompany each arrowhead. Examples from the report are provided below.



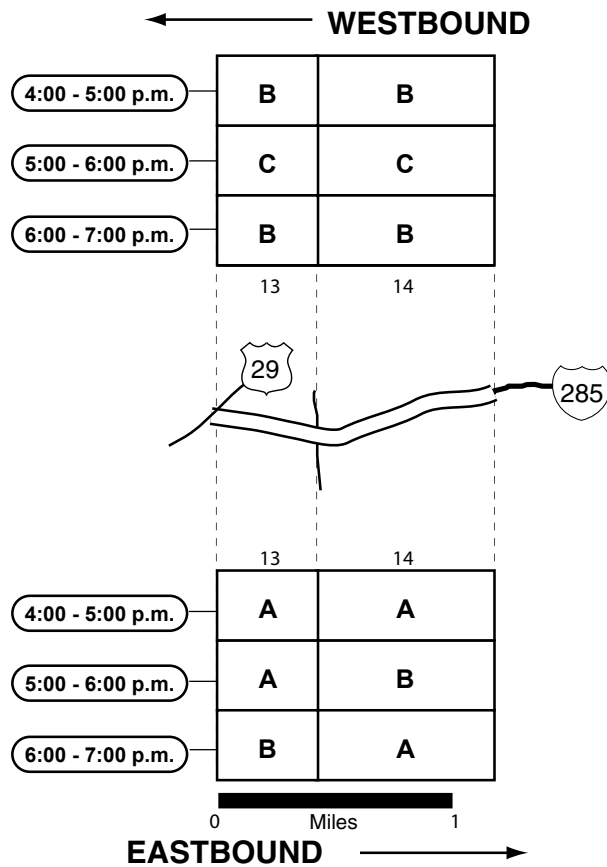
SR 14 (Fulton County) - Morning



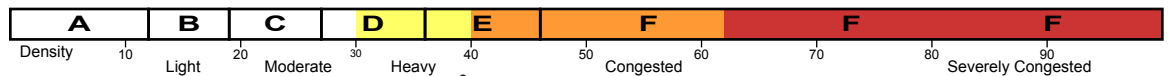
Traffic Quality Rating

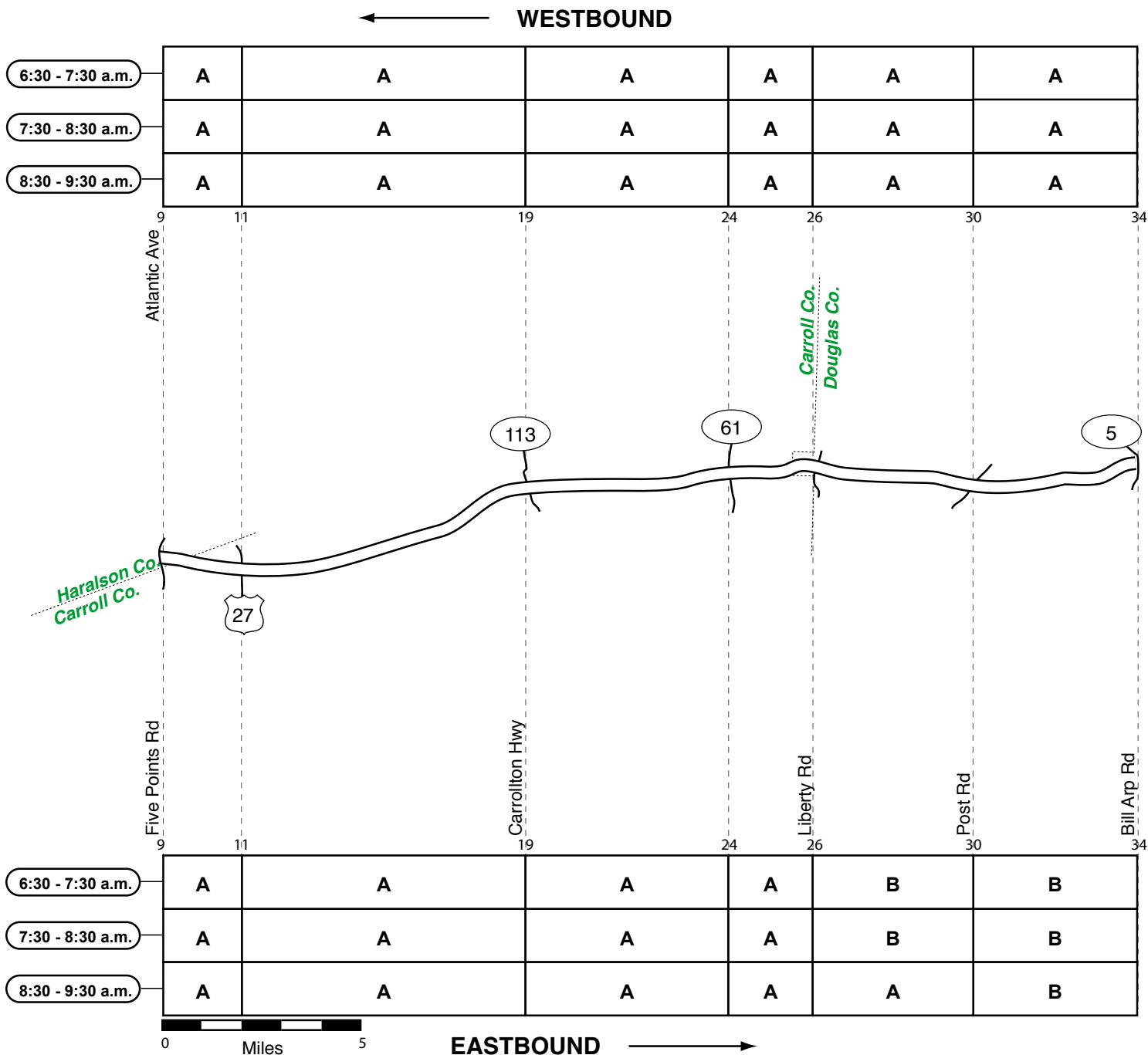
Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

SR 14 (Fulton County) - Evening

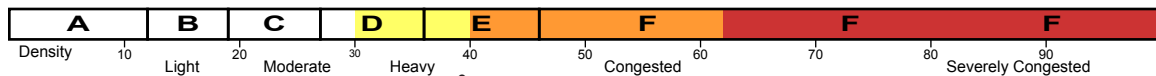


Traffic Quality Rating

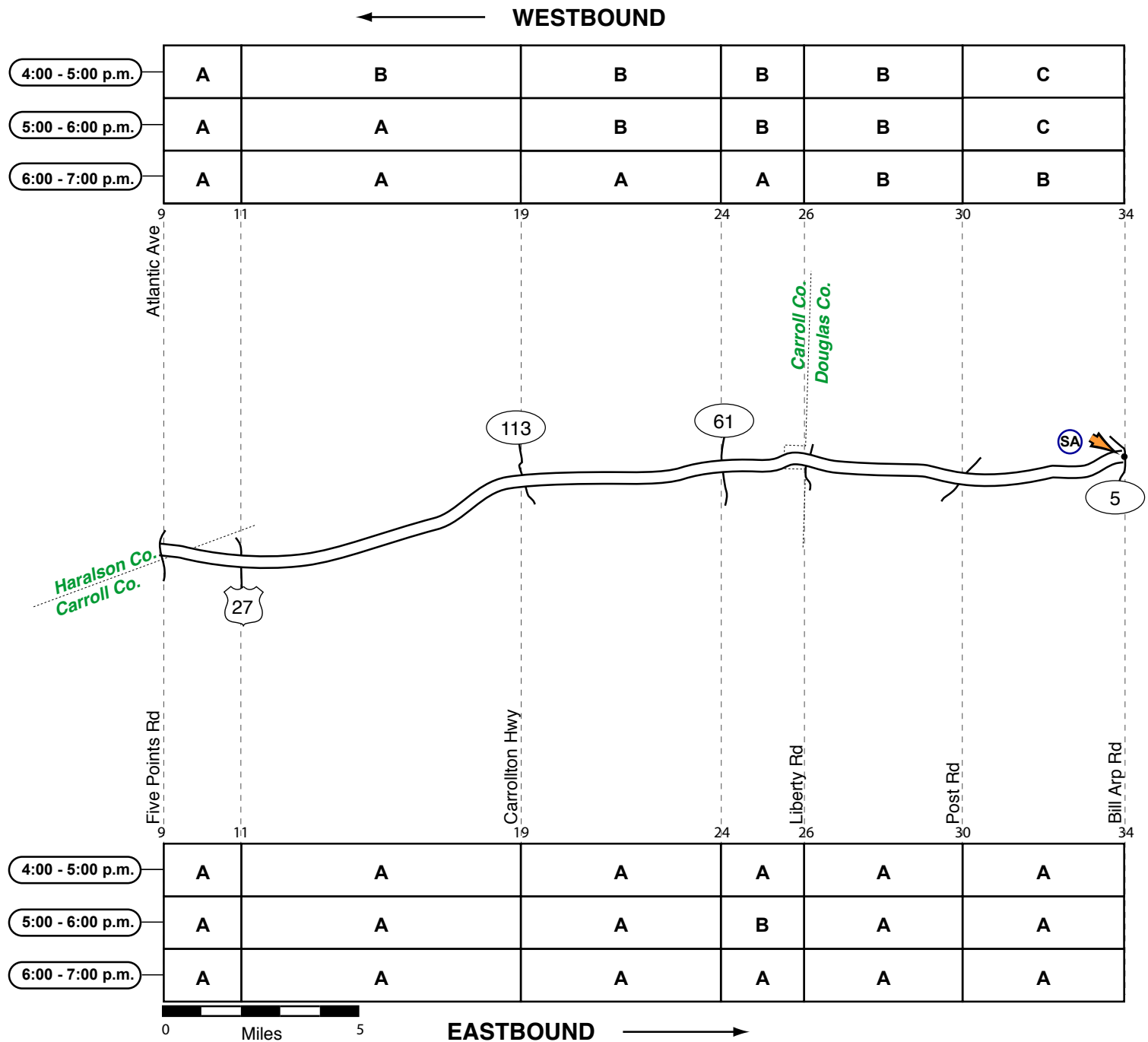
Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-20 (Carroll & Douglas Counties) - Morning

Traffic Quality Rating

**Superscripts:** ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-20 (Carroll & Douglas Counties) - Evening



SA

Congestion Type: Surveyed Cross Road Signal Queue

Location: SR 5

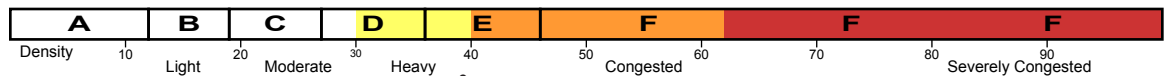
Frequency: Intermittent

Direction: Southbound

Queue Population: 20 to 30 vpl

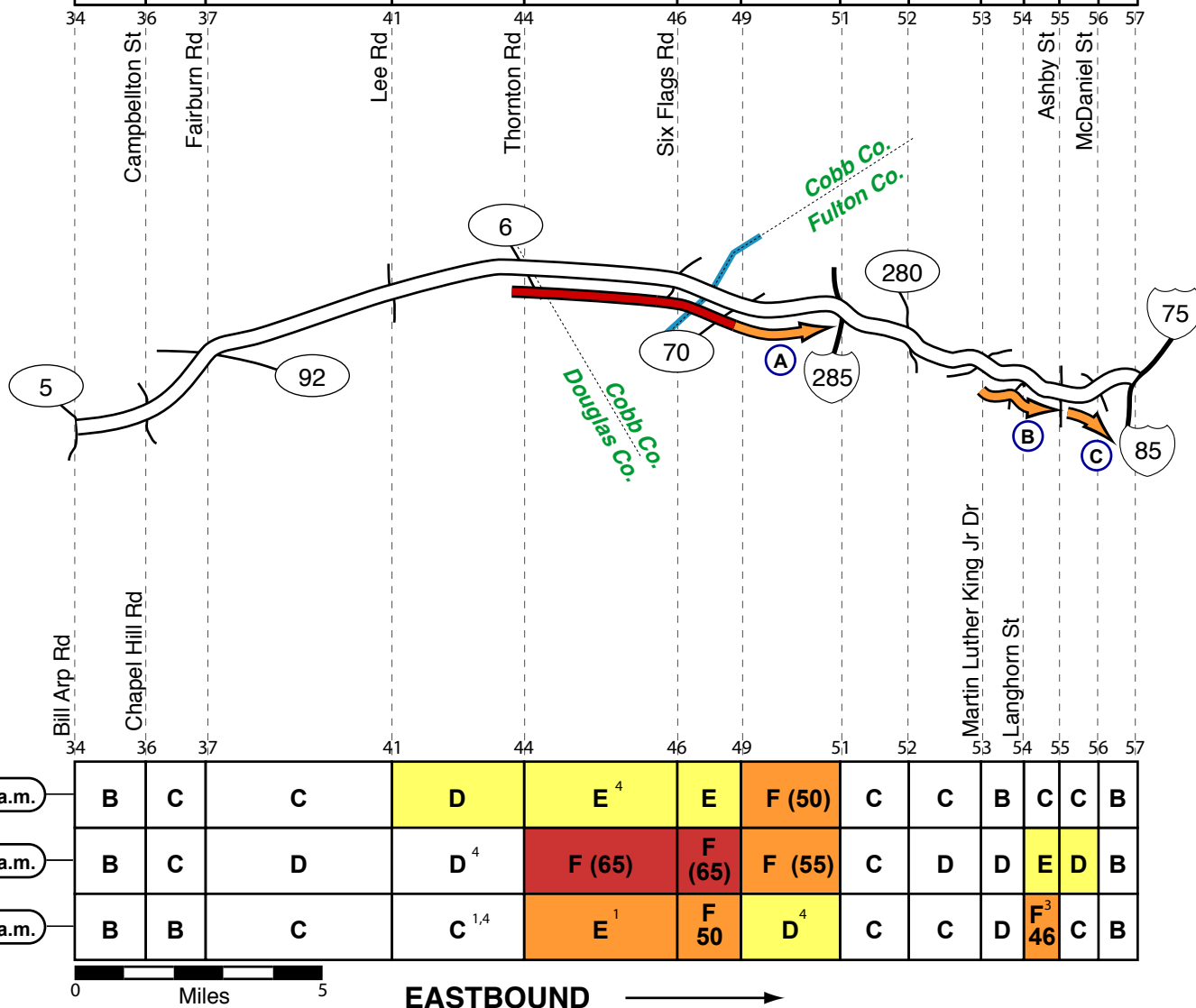
Number of Lanes: 2

Traffic Quality Rating

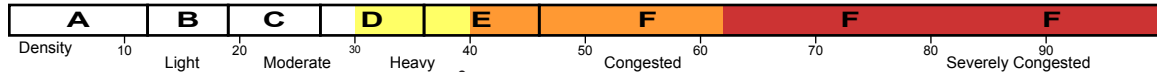
Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-20 (Douglas/Cobb & Fulton Counties) - Morning← **WESTBOUND**

6:30 - 7:30 a.m.	A	A	A	A	A	A	B	A	A	A	B	B	B
7:30 - 8:30 a.m.	A	A	A	A	A	A	B	B	A	B	B	C	B
8:30 - 9:30 a.m.	A	A	A	A	A	A	B	A	A	A	A	C	B



Traffic Quality Rating

**Superscripts:** ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-20 (Douglas/Cobb & Fulton Counties) - Morning

A

Congestion Type: Mainline Congestion

Frequency: Most observations after 7:00 a.m.

Direction: Eastbound

Location: Between SR 6 and I-285

Queue Length: 6 to 7 miles

Estimated Speed: 25 to 50 mph

Potential Cause(s): Factors that may have exacerbated the congestion included: 1) traffic entering the mainline at the interchanges along this section of I-20; 2) two separate lane drops (4 lanes to 3) - one at Fulton Industrial Blvd (SR 70) - one between SR 6 and Riverside Pkwy and; 3) sun glare.

B

Congestion Type: Mainline Congestion

Frequency: Most observations after 8:00 a.m.

Direction: Eastbound

Location: Between Martin Luther King Dr and Ashby St

Queue Length: 1 to 2 miles

Estimated Speed: 40 to 50 mph

Potential Cause(s): Eastbound congestion appeared to be caused or exacerbated by sun glare and the roadway geometrics (curves).

C

Congestion Type: Exit Ramp Queue

Location: McDaniel St

Frequency: Intermittent

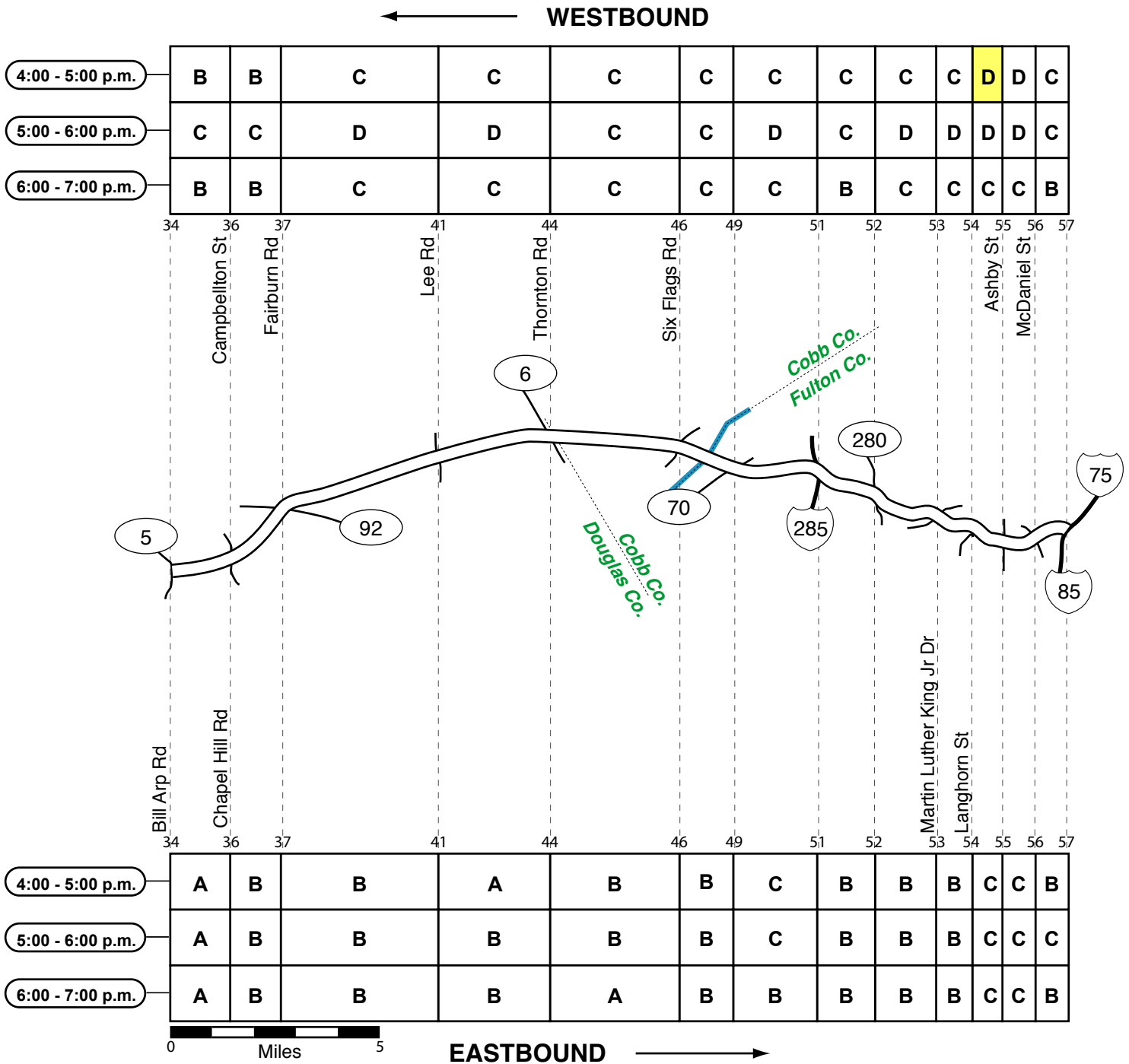
Direction: Eastbound

Queue Population: 20 to 25 vpl

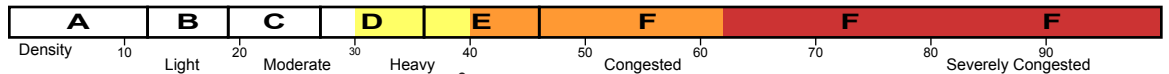
Number of Lanes:

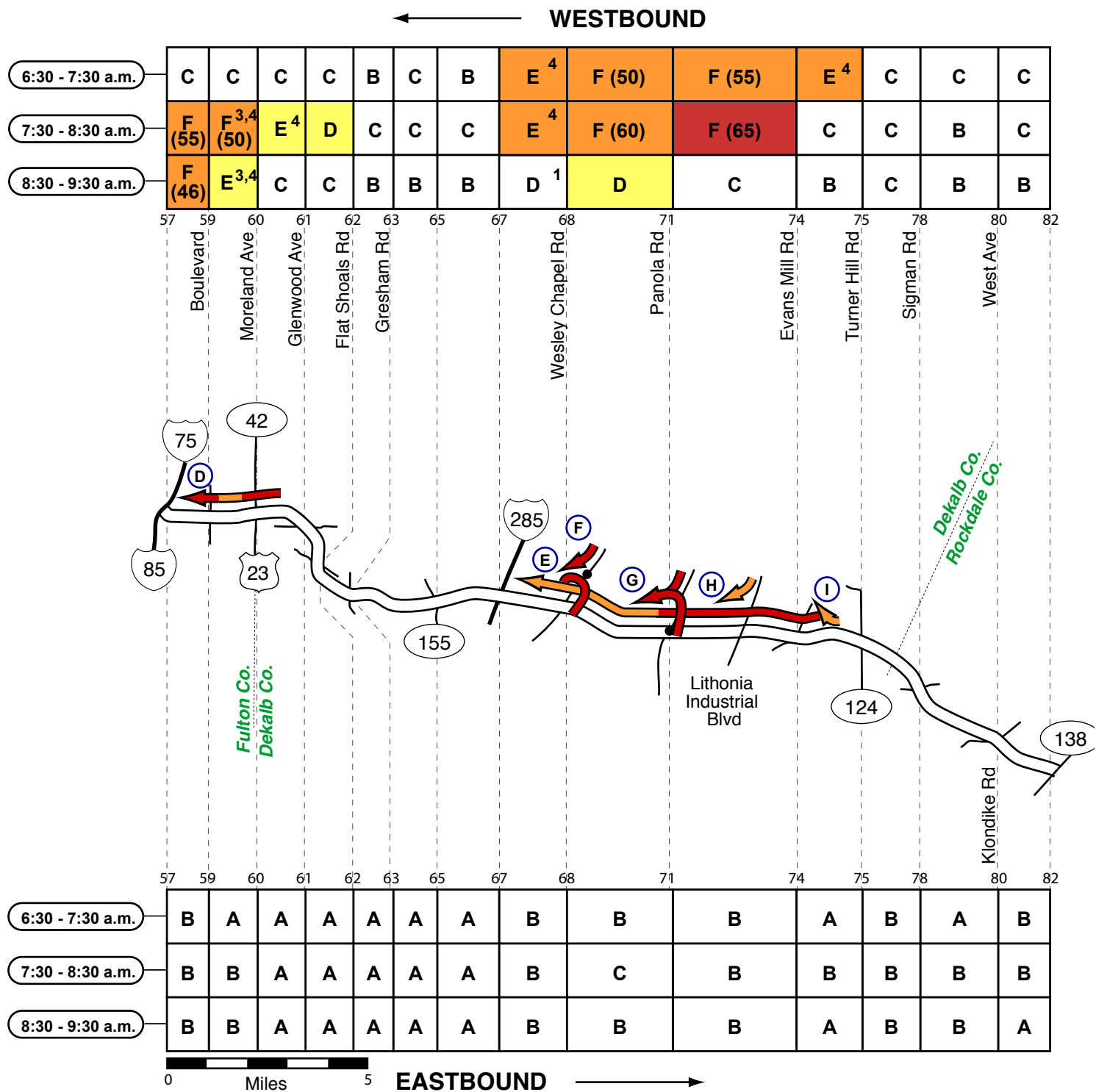
Note: In some cases, congestion in the left-turn lanes on the exit ramp extended back into the right lane on I-20.

I-20 (Douglas/Cobb & Fulton Counties) - Evening

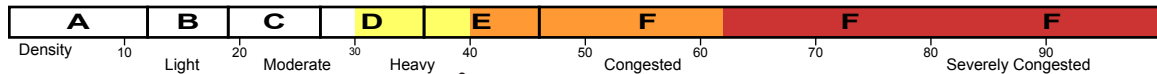


Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-20 (Fulton/Dekalb & Rockdale Counties) - Morning

Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-20 (Fulton/Dekalb & Rockdale Counties) - Morning

D

Congestion Type: Mainline Congestion

Frequency: Most observations after 7:30 a.m.

Direction: Westbound

Location: Between SR 42 and I-78/85

Queue Length: 2 to 4 miles

Estimated Speed: 30 to 50 mph

Potential Cause(s): Factors contributing to the congestion included:

1) the lane drop at the terminus of the HOV facility (5 lanes to 4); 2) congestion on the two-lane ramp to I-75 northbound (this congestion backed into the two right lanes, and ultimately across all lanes on I-20).

E

Congestion Type: Mainline Congestion

Frequency: Most observations before 8:30 a.m.

Direction: Westbound

Location: Between SR 124 (Turner Hill Rd) and I-285

Queue Length: 5 to 8 miles

Estimated Speed: 20 to 50 mph

Potential Cause(s): Traffic entering the mainline at the interchanges along this section of I-20 appeared to exacerbate the congestion.

Congestion between Evans Mill Rd and Panola Rd was particularly severe during the peak period with average speeds estimated at 20 to 40 mph; while congestion typically persisted west of Panola Rd, speeds typically improved (40-50 mph).

F

Congestion Type: Entrance Ramp Queue

Frequency: Peak Hour

Direction: NB & SB

Location: Wesley Chapel Rd

Queue Population: 30 to 50 vpl

Number of Lanes: 2

Note: Congestion on Wesley Chapel Rd was typically found in both directions approaching the I-20 Interchange (left two lanes northbound; right two lanes southbound); the head of the queues was found either at the signals or at the head of the entrance ramp where vehicles merged into congested westbound flow on I-20. The lane drop (2 lanes to 1) on the entrance ramp may have exacerbated the congestion.

G

Congestion Type: Entrance Ramp Queue

Frequency: Peak Hour

Direction: NB & SB

Location: Panola Rd

Queue Population: 20 to 50 vpl

Number of Lanes: 1

Note: Congestion on Panola Rd was typically found in both directions approaching the I-20 Interchange (left lane northbound; right lane southbound); the head of the queues was found either at the signals or at the head of the entrance ramp where vehicles merged into congested westbound flow on I-20.

H

Congestion Type: Entrance Ramp Queue

Frequency: Intermittent

Direction: Westbound

Location: Lithonia Industrial Blvd

Queue Population: 20 to 40 vpl

Number of Lanes: 1

Note: When congested, the head of the queue was found where vehicles merged into westbound flow on I-20; the lane drop (2 lanes to 1) on the entrance ramp appeared to exacerbate congestion.

I

Congestion Type: Exit Ramp Queue

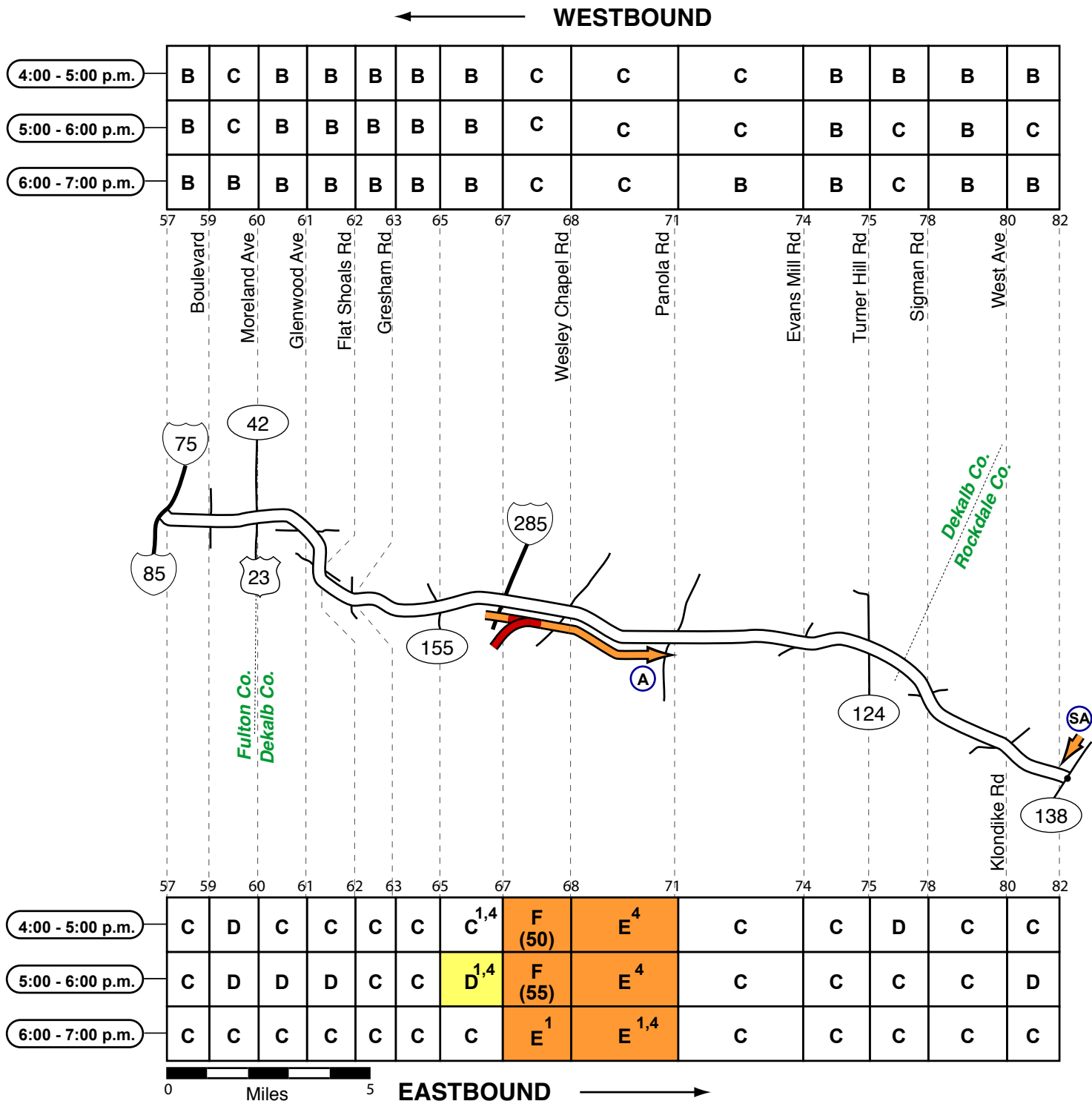
Location: Evans Mill Rd

Frequency: Intermittent

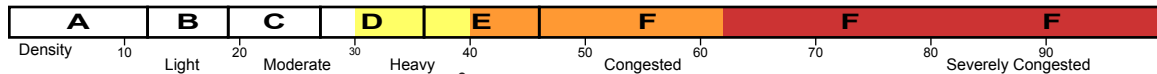
Direction: Westbound

Queue Population: 20 to 40 vpl

Number of Lanes: 2

I-20 (Fulton/Dekalb & Rockdale Counties) - Evening

Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-20 (Fulton/Dekalb & Rockdale Counties) - Evening

A

Congestion Type: Mainline Congestion

Frequency: Most Observations

Direction: Eastbound

Location: Between SR 155 and Panola Rd

Queue Length: 4 to 5 miles

Estimated Speed: 30 to 50 mph

Potential Cause(s): The primary bottleneck was the series of lane drops (6 lanes to 3) between the I-285 merge and Wesley Chapel Rd.

SA

Congestion Type: Surveyed Cross Road Signal Queue

Location: SR 138

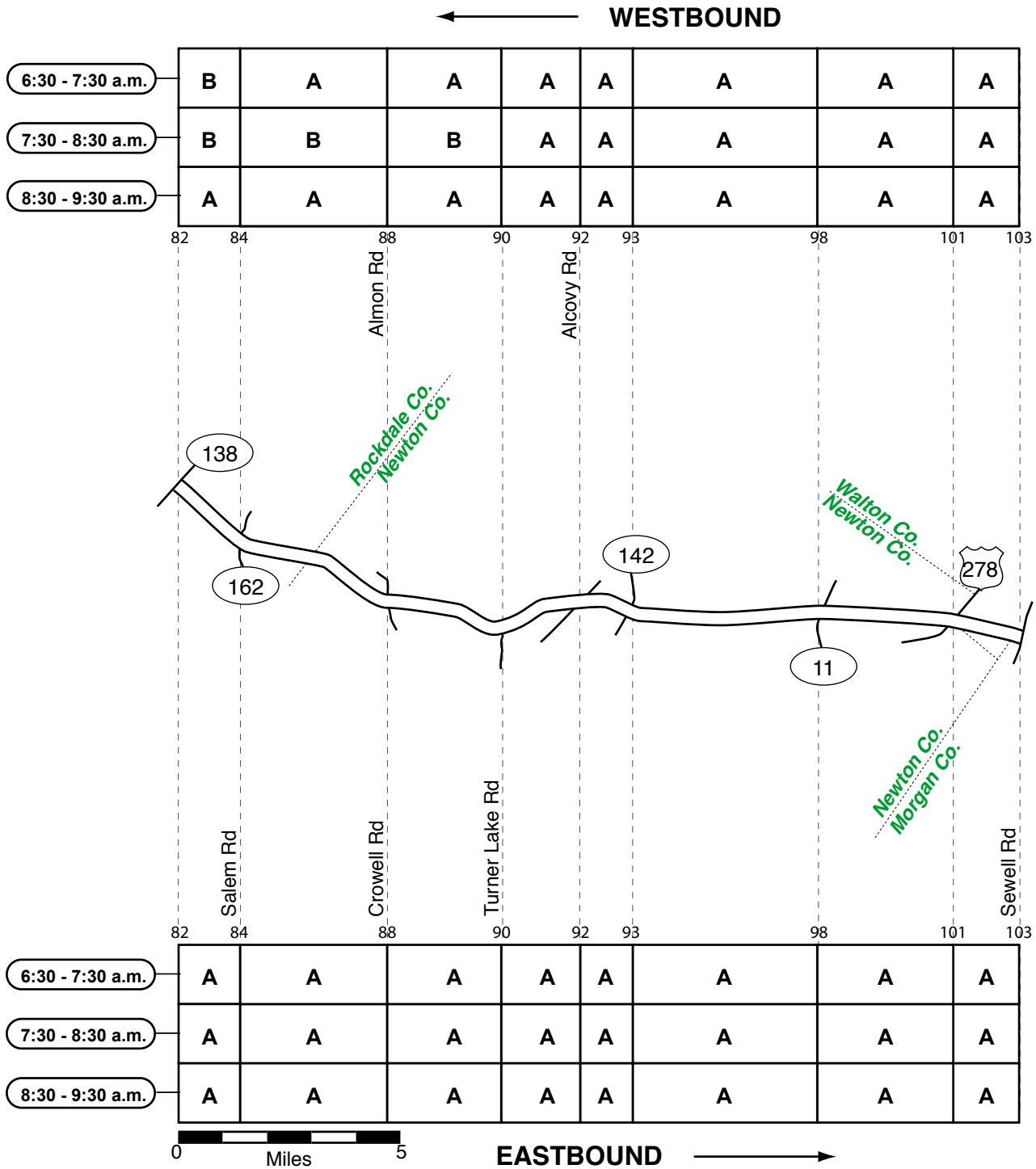
Frequency: Intermittent

Direction: Southbound

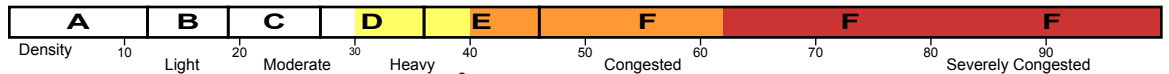
Queue Population: 20 to 45 vpl

Number of Lanes: 2

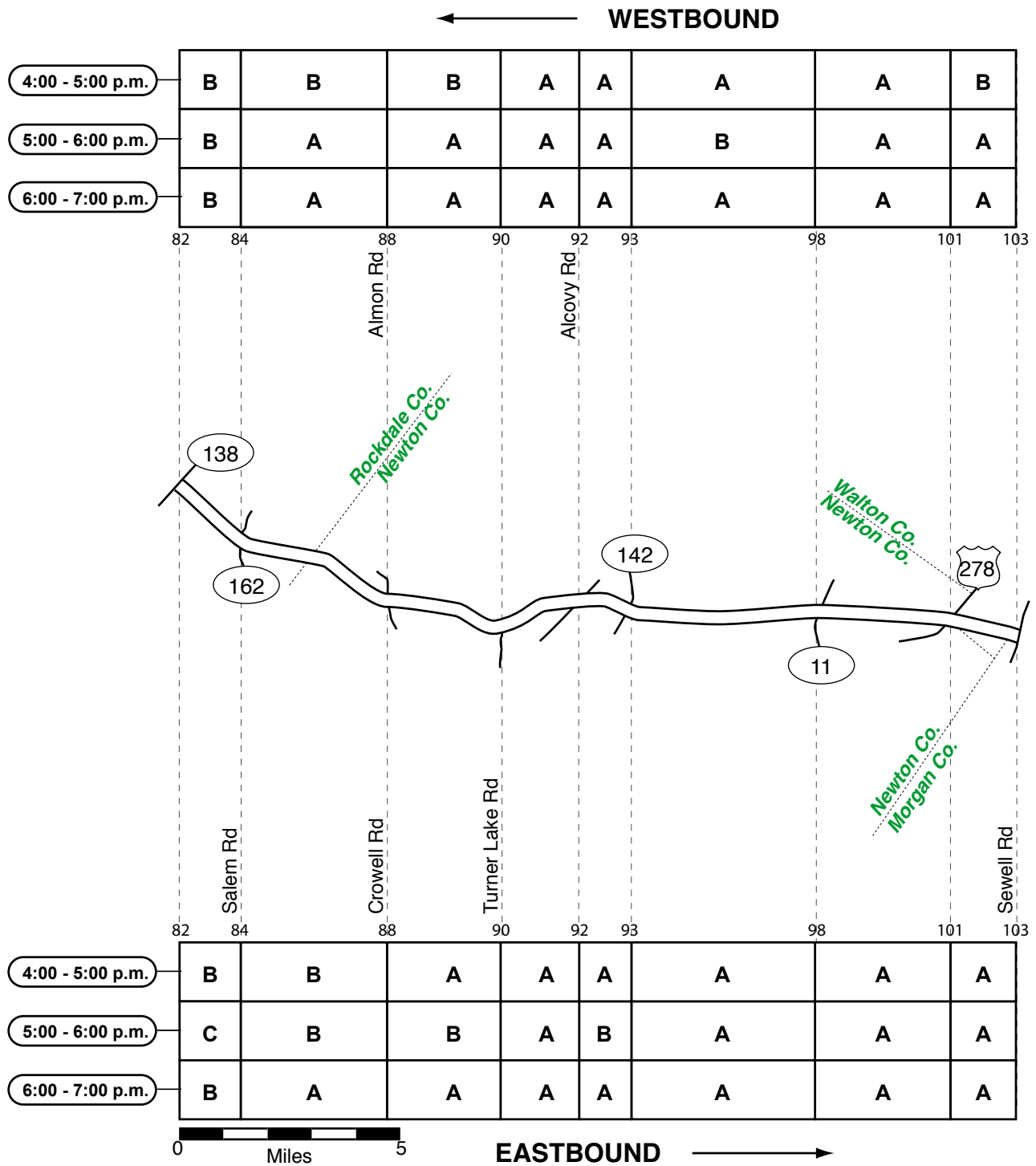
Note: When congested, the queue at I-20 typically extended back through the upstream signal at Dogwood Dr.

I-20 (Rockdale & Newton Counties) - Morning

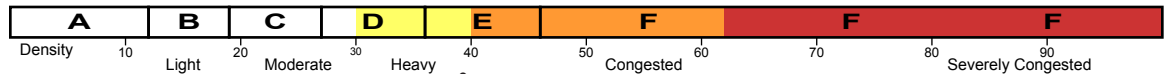
Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

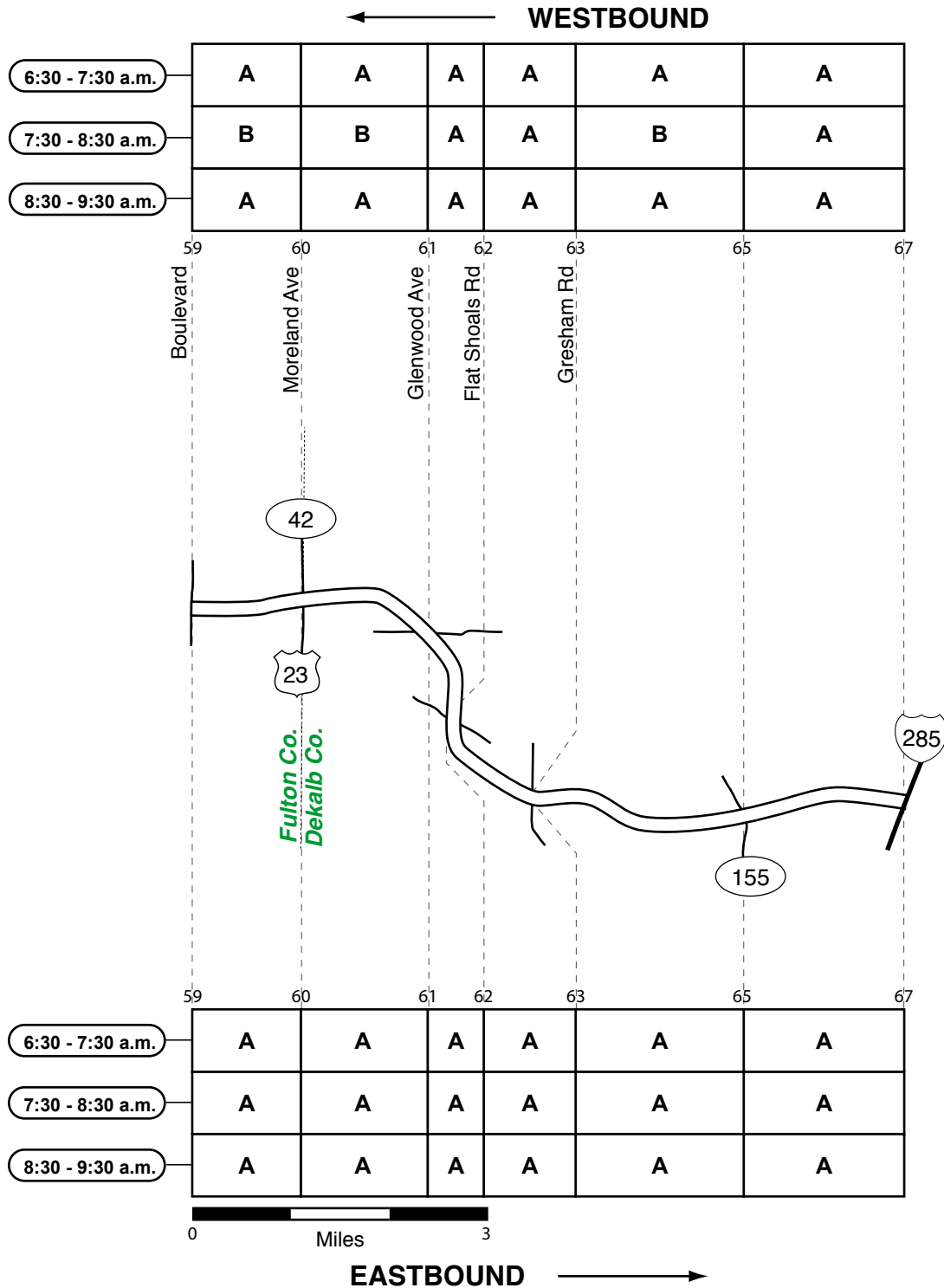
I-20 (Rockdale & Newton Counties) - Evening



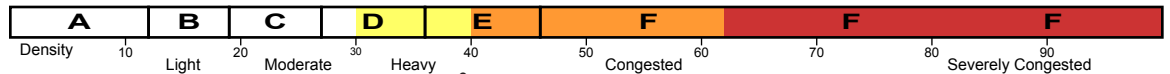
Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

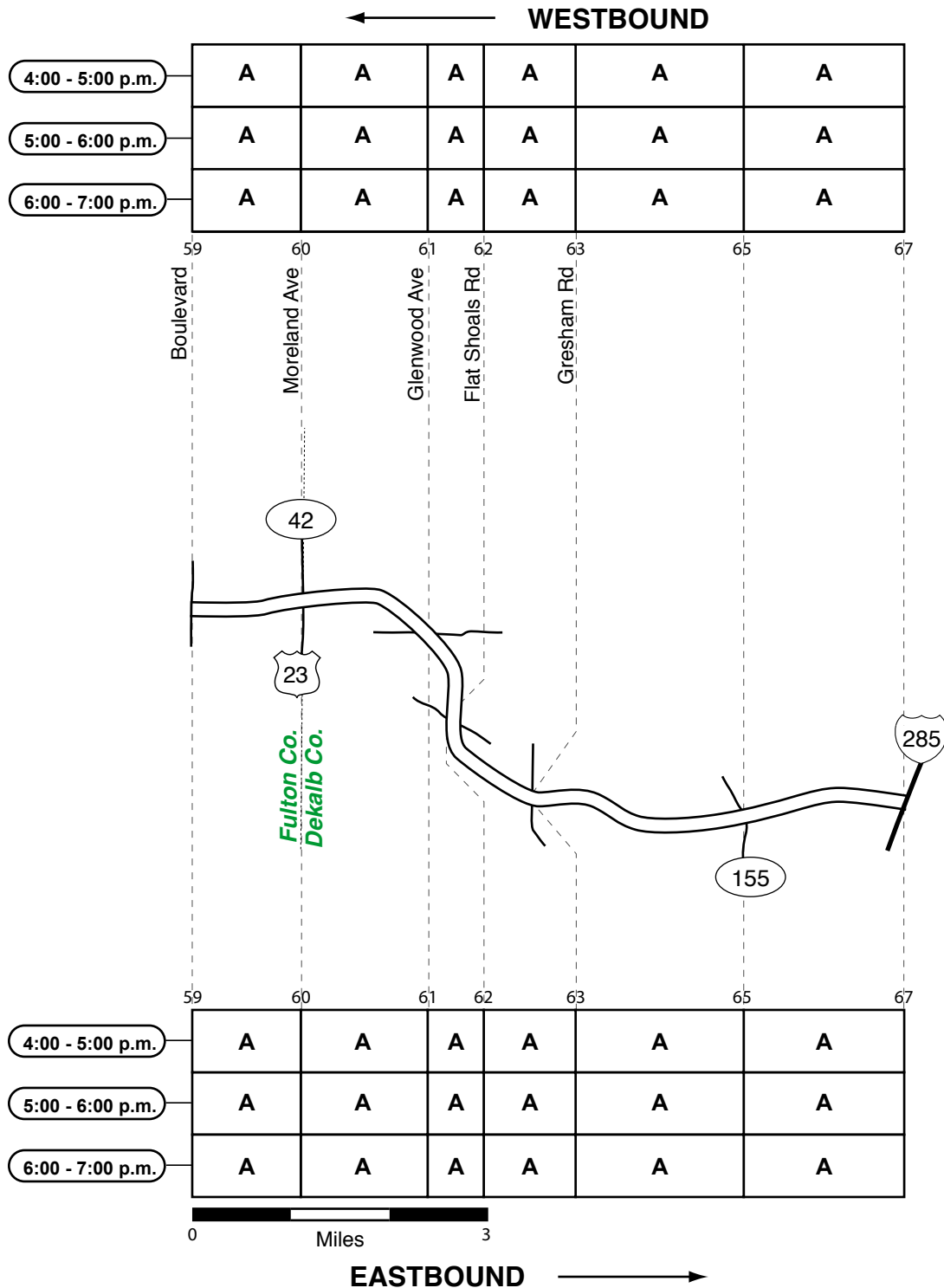
I-20 HOV (Fulton & DeKalb Counties) - Morning



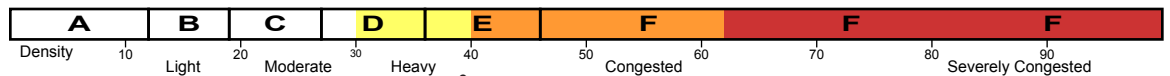
Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

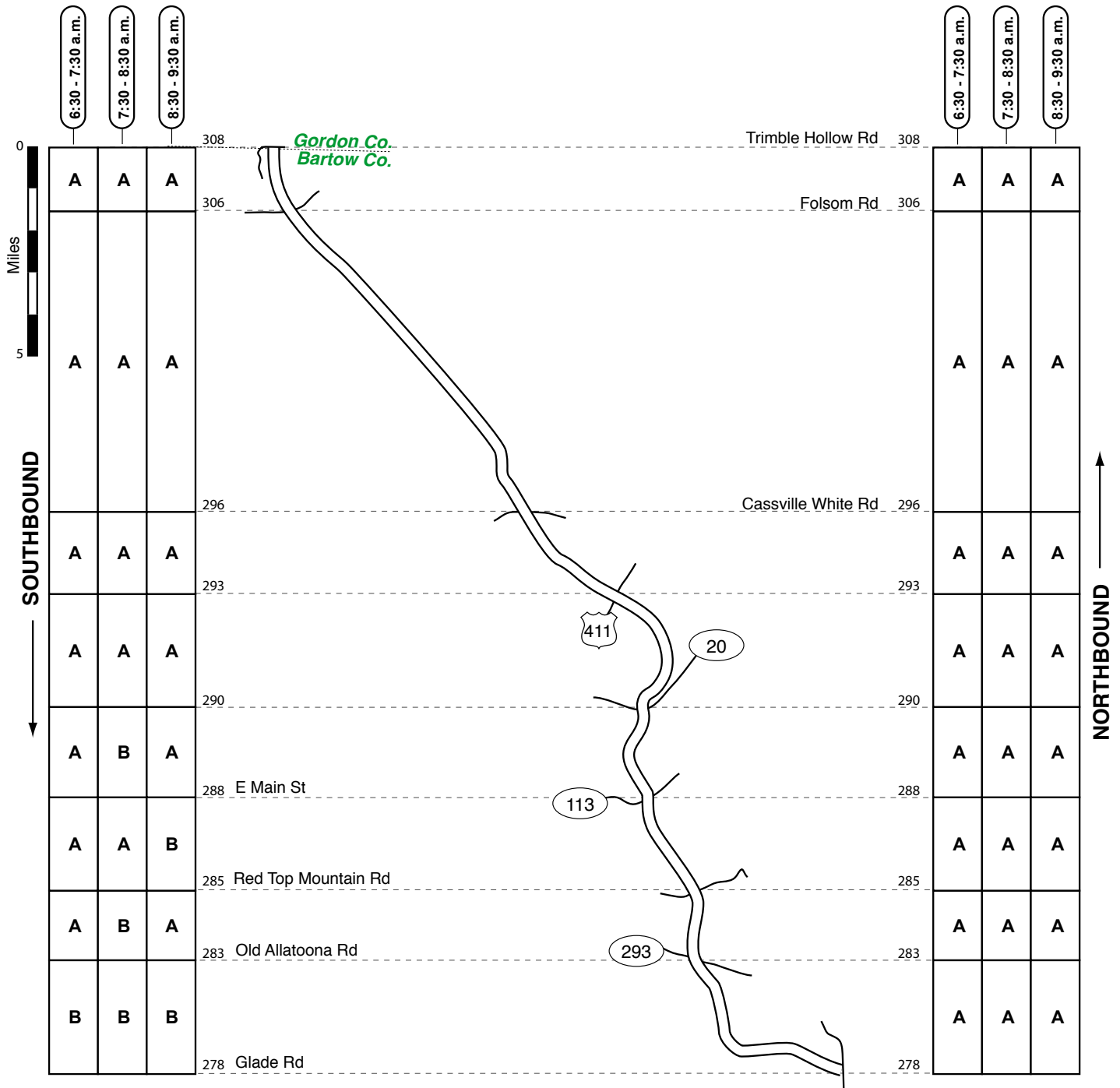
I-20 HOV (Fulton & DeKalb Counties) - Evening



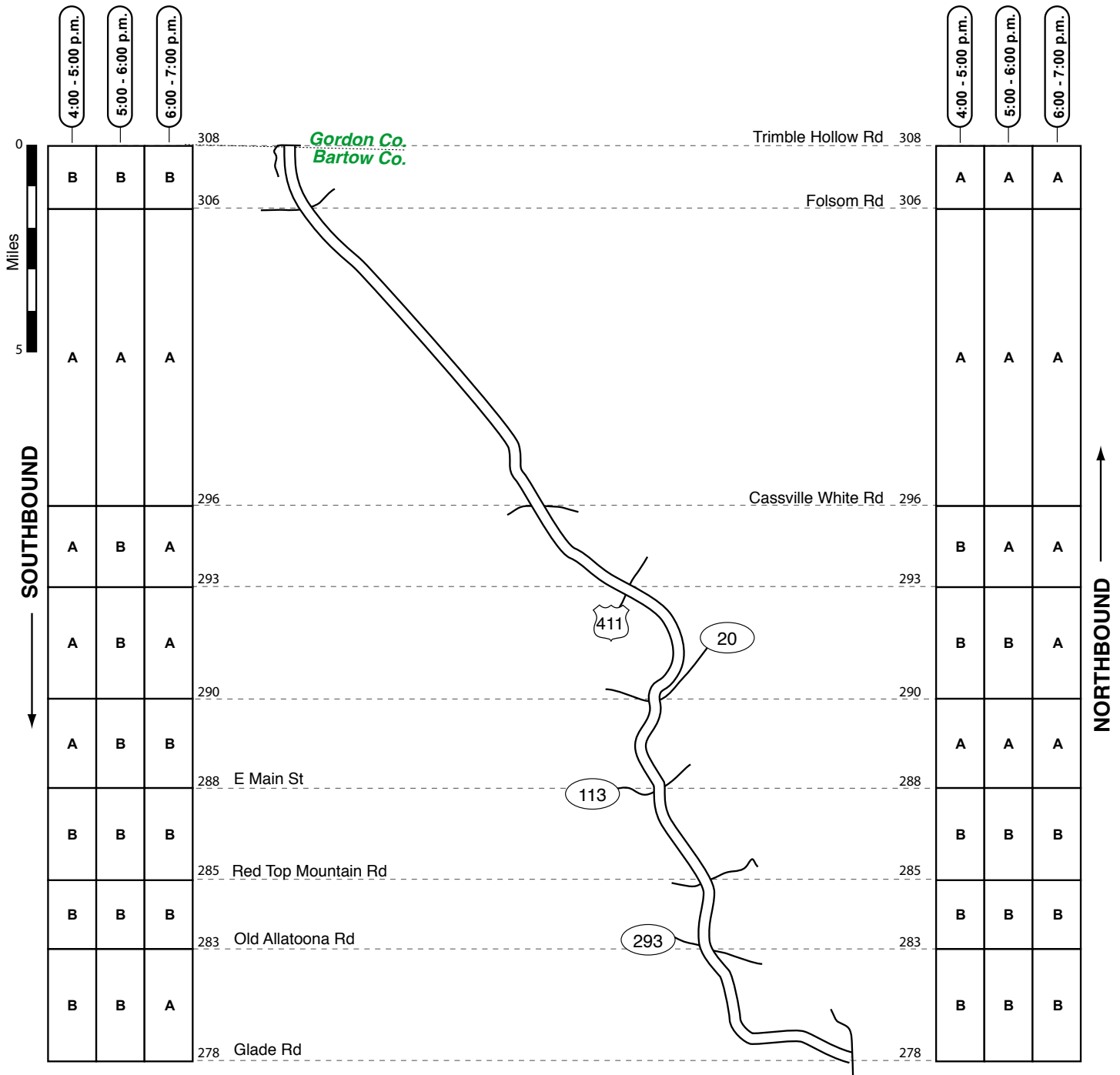
Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

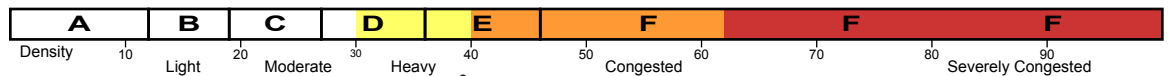
I-75 (Bartow County) - Morning

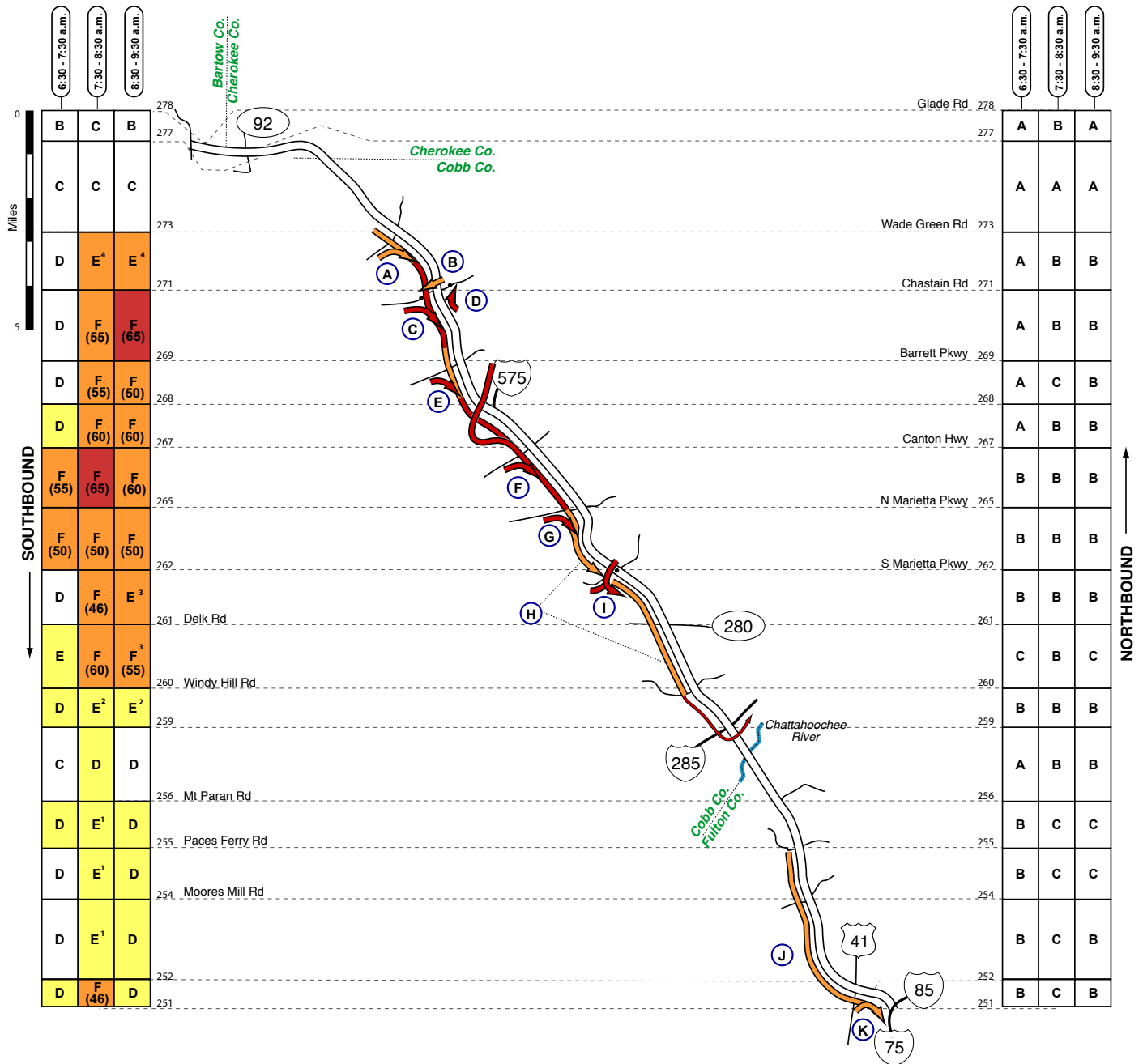
Superscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

I-75 (Bartow County) - Evening

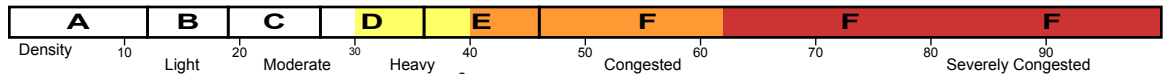


Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-75 (Bartow/Cherokee/Cobb & Fulton Counties) - Morning

Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-75 (Bartow/Cherokee/Cobb & Fulton Counties) - Morning

A

Congestion Type: Entrance Ramp Queue
 Location: Wade Green Rd
 Frequency: One time only
 Direction: Southbound
 Queue Population: 25 to 35 vpl
 Number of Lanes: 1

B

Congestion Type: Cross Road Signal Queue
 Location: Chastain Rd
 Frequency: Intermittent
 Direction: Westbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 2

C

Congestion Type: Entrance Ramp Queue
 Location: Chastain Rd
 Frequency: One time only
 Direction: Southbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 2
 Note: The head of the queue was found at the ramp meter signal.

D

Congestion Type: Exit Ramp Queue
 Location: Chastain Rd
 Frequency: Peak Hour
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

E

Congestion Type: Entrance Ramp Queue
 Location: Barrett Parkway
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 35 to 45 vpl
 Number of Lanes: 1
 Note: The head of the queue was found at the ramp meter signal; congestion extended back into the "exit-only" lane on Barrett Parkway.

F

Congestion Type: Entrance Ramp Queue
 Location: Canton Rd Connector
 Frequency: Most Observations
 Direction: Southbound
 Queue Population: 40 to 60 vpl
 Number of Lanes: 2
 Note: Factors contributing to the congestion were: 1) the ramp meter and; 2) the merge into congested flow on I-75.

G

Congestion Type: Entrance Ramp Queue
 Location: N. Marietta Parkway
 Frequency: Most observations after 7:30 a.m.
 Direction: Southbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 1
 Note: Factors contributing to the congestion were: 1) the ramp meter and; 2) the merge into congested flow on I-75.

H

Congestion Type: Mainline Congestion
 Frequency: Most Observations
 Direction: Southbound
 Location: Between Wade Green Rd and I-285
 Queue Length: 10 to 13 miles
 Estimated Speed: 25 to 50 mph
 Potential Cause(s): Factors contributing to the congestion were: 1) traffic entering at the interchanges along this corridor and; 2) congestion on the ramp to the Perimeter (Eastbound) extending back into the right two lanes of I-75.

I

Congestion Type: Entrance Ramp Queue
 Location: S. Marietta Parkway
 Frequency: Most observations after 7:30 a.m.
 Direction: Southbound
 Number of Lanes: 1
 Note: The head of the queue was found at the ramp meter; congestion typically extended back into the mainline of S. Marietta Parkway.

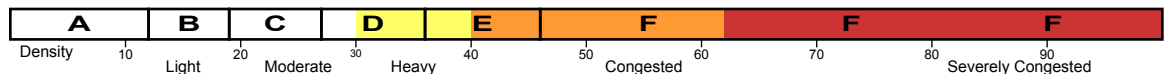
J

Congestion Type: Mainline Congestion
 Frequency: On some days but not others
 Direction: Southbound
 Location: Between Paces Ferry Rd and the I-75 / I-85 merge
 Queue Length: 3 to 4 miles
 Estimated Speed: 30 to 50 mph
 Potential Cause(s): The merging associated with the interchanges along this corridor.

K

Congestion Type: Entrance Ramp Queue
 Location: SR 3 / US 41
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 25 to 35 vpl
 Number of Lanes: 1
 Note: Factors contributing to the congestion were: 1) the ramp meter and; 2) the merge into congested flow on I-75.

Traffic Quality Rating

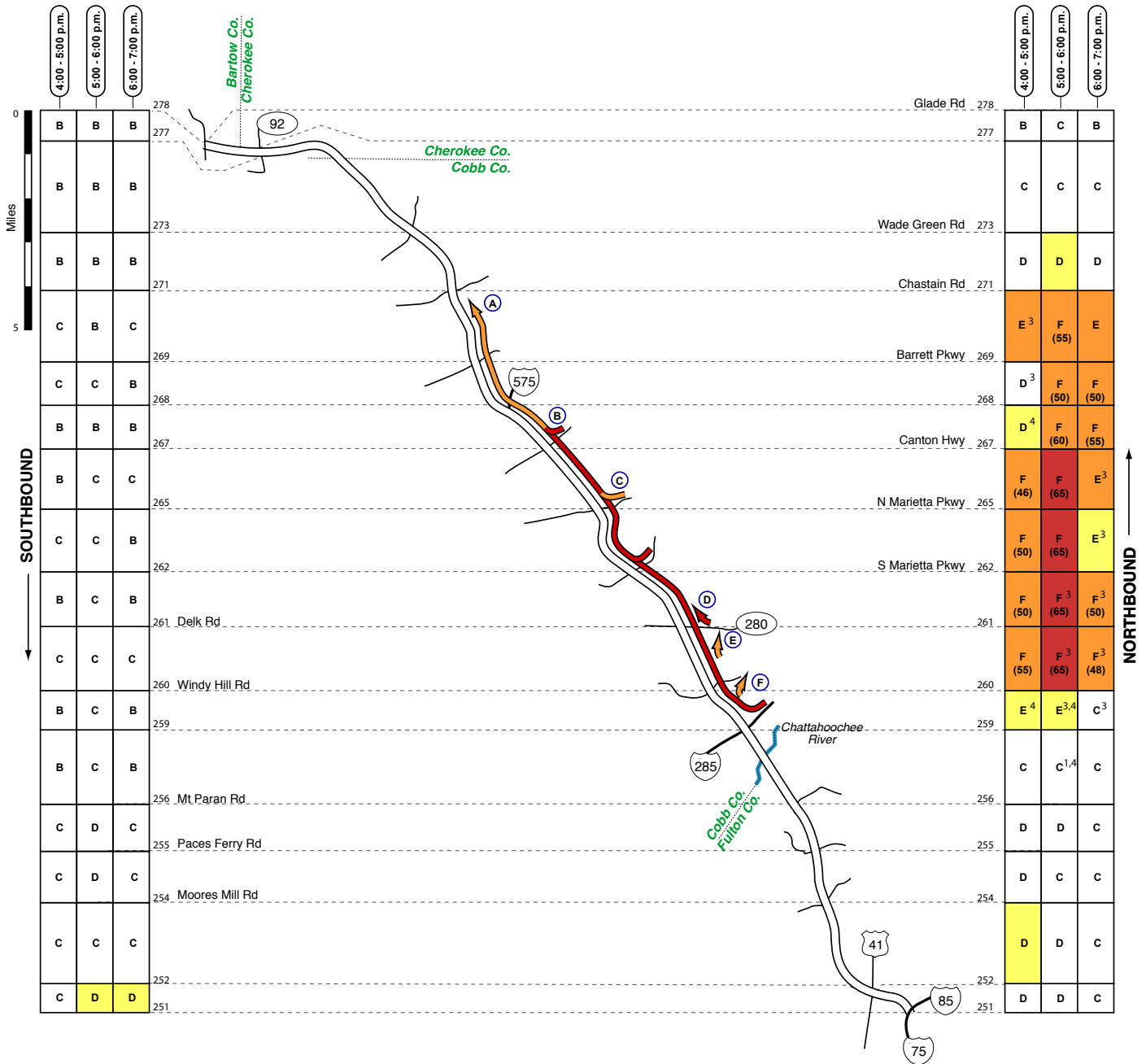


Superscripts: ¹ Type 1 nested congestion (some days, not others).

² Type 2 nested congestion (more severe in left or right-hand lanes).

³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).

I-75 (Bartow/Cherokee/Cobb & Fulton Counties) - Evening

I-75 (Bartow/Cherokee/Cobb & Fulton Counties) - Evening

A

Congestion Type: Mainline Congestion

Frequency: Most Observations

Direction: Northbound

Location: Between the Perimeter and Chastain Rd

Queue Length: 12 to 14 miles

Estimated Speed: 20 to 50 mph

Potential Cause(s): Factors contributing to the congestion were: 1) the two separate lane drops at I-575 (6 lanes to 4) and Barrett Pkwy (4 lanes to 3) and; 2) merging associated with the Perimeter, Marietta Parkway (North and South), Canton Rd Connector and I-575 interchanges.

B

Congestion Type: Entrance Ramp Queue

Location: Canton Highway

Frequency: Peak Hour

Direction: Northbound

Queue Population: 20 to 40 vpl

Number of Lanes: 2

Note: The head of the queue was found at the ramp meter signal. During one observation, congestion extended back onto the flyover ramp from Canton Highway (eastbound); the right lane of two at the signal was under-utilized.

C

Congestion Type: Entrance Ramp Queue

Location: N. Marietta Parkway

Frequency: Intermittent

Direction: Northbound

Queue Population: 20 to 25 vpl

Number of Lanes: 1

Note: Factors contributing to the congestion were: 1) the ramp meter and; 2) the merge into congested flow on I-75.

D

Congestion Type: Entrance Ramp Queue

Location: SR 280

Frequency: Most observations before 6:00 p.m.

Direction: Northbound

Queue Population: 20 to 30 vpl

Number of Lanes: 1

Note: The head of the queue was found at the ramp meter.

E

Congestion Type: Exit Ramp Queue

Location: SR 280

Frequency: One time only

Direction: Northbound

Queue Population: 20 to 25 vpl

Number of Lanes: 1

F

Congestion Type: Exit Ramp Queue

Location: Windy Hill Rd

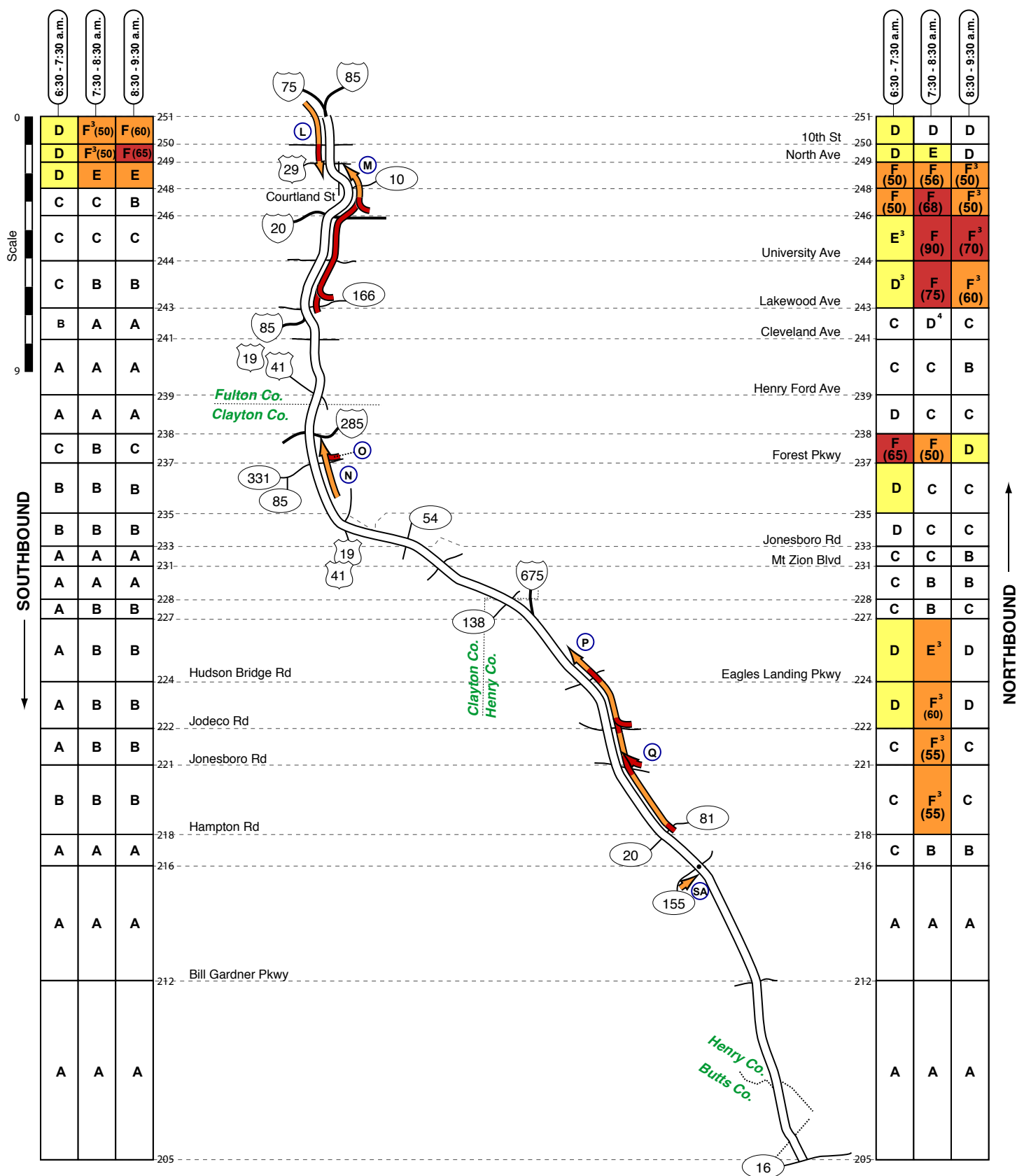
Frequency: Intermittent

Direction: Northbound

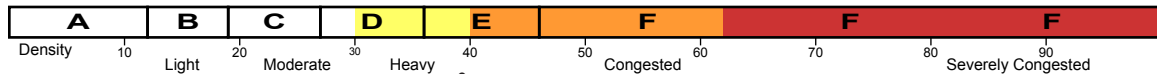
Queue Population: 25 to 30 vpl

Number of Lanes: 2

I-75 (Fulton/Clayton & Henry Counties) - Morning



Traffic Quality Rating



Superscripts: ¹Type 1 nested congestion (some days, not others).

³Type 3 nested congestion (present only in the first or second half-hour period).

²Type 2 nested congestion (more severe in left or right-hand lanes).

⁴Type 4 nested congestion (partial length of segment).

I-75 (Fulton/Clayton & Henry Counties) - Morning**L**

Congestion Type: Mainline Congestion
Frequency: On two of four surveyed mornings after 8:00 a.m.
Direction: South-eastbound
Location: Between the I-75/I-85 merge and SR 10
Queue Length: 1 to 2 miles
Estimated Speed: 15 to 50 mph
Potential Cause(s): The head of the queue was found at the signal at the head of the Exit 249C ramp; congestion on the two lane ramp extended back into the right lanes (and eventually across all lanes of I-75/I-85).

M

Congestion Type: Mainline Congestion
Frequency: Most observations between 7:00 and 9:00 a.m.
Direction: Northbound
Location: Between SR 166 and US 29
Queue Length: 4 to 5 miles
Estimated Speed: 15 to 35 mph
Potential Cause(s): Factors contributing to the congestion were: 1) traffic entering at the SR 166 and I-20 interchanges and; 2) the two separate lane drops approaching the I-20 interchange (6 lanes to 5 and 5 lanes to 4).

N

Congestion Type: Mainline Congestion
Frequency: Most observations before 8:30 a.m.
Direction: Northbound
Location: Between US 19/41 and I-285
Queue Length: 1 to 1.5 miles
Estimated Speed: 30 to 50 mph
Potential Cause(s): The merging associated with the SR 331 and I-285 interchanges

O

Congestion Type: Entrance Ramp Queue
Location: SR 331
Frequency: Most Observations
Direction: Northbound
Queue Population: 30 to 50 vpl
Number of Lanes: 1

P

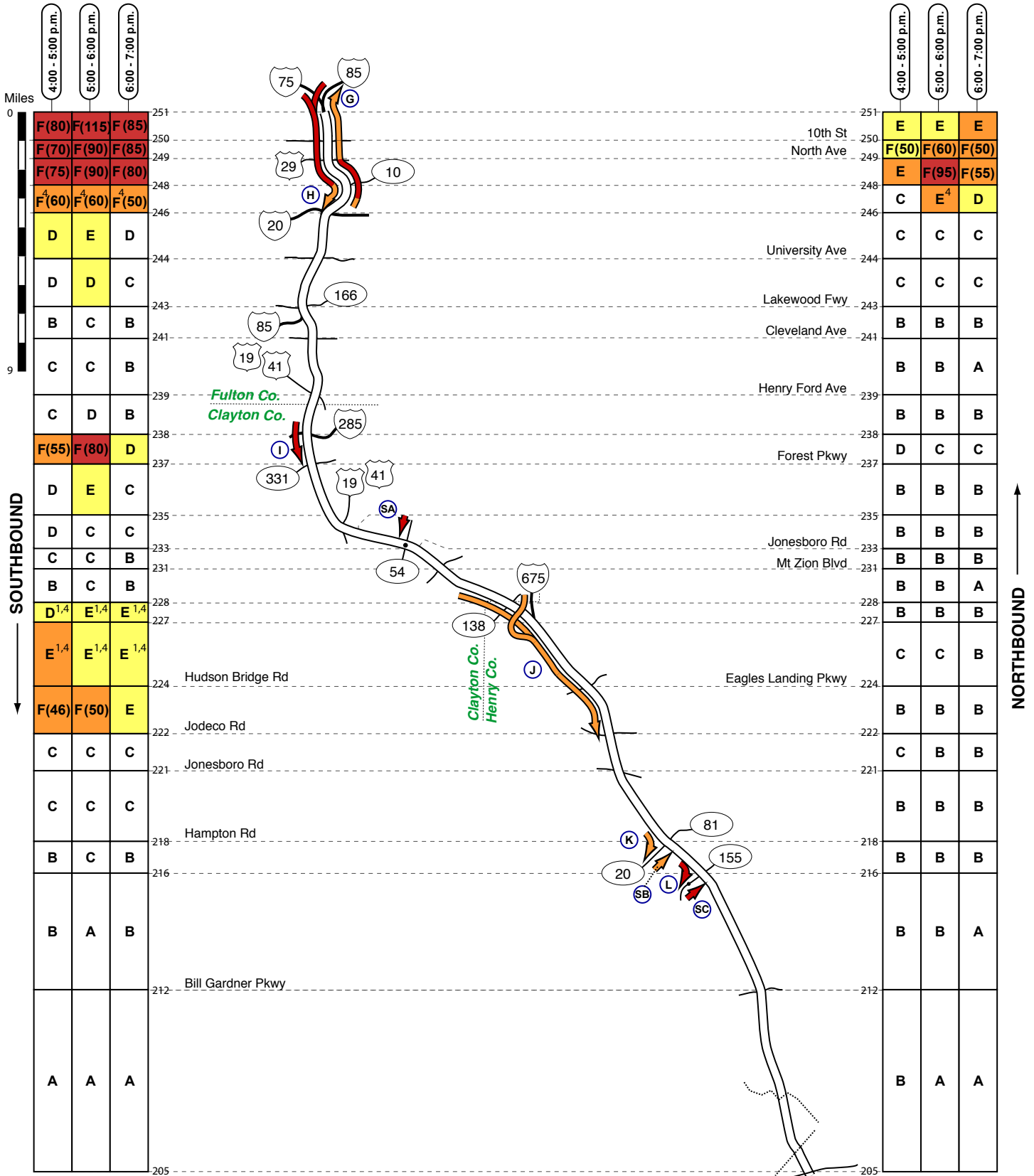
Congestion Type: Mainline Congestion
Frequency: Between 7:30 and 8:00 a.m.
Direction: Northbound
Location: Between SR 81 and I-675
Queue Length: 4 to 7 miles
Estimated Speed: 20 to 50 mph
Potential Cause(s): Traffic entering at the interchanges along this corridor.

Q

Congestion Type: Entrance Ramp Queue
Location: Jonesboro Rd
Frequency: Peak Hour
Direction: Northbound
Queue Population: 20 to 30 vpl
Number of Lanes: 1

SA

Congestion Type: Surveyed Cross Road Signal Queue
Location: SR 155
Frequency: Intermittent
Direction: Northbound
Queue Population: 20 to 25 vpl
Number of Lanes: 1
Note: During one observation, vehicles were queued in the dedicated left-turn lane at the I-75 northbound ramp.

I-75 (Fulton/Clayton & Henry Counties) - EveningSuperscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

I-75 (Fulton/Clayton & Henry Counties) - Evening

G

Congestion Type: Mainline Congestion
Frequency: Most Observations
Direction: Northbound
Location: Between I-20 and the I-75/I-85 split
Queue Length: 2 to 4 miles
Estimated Speed: 15 to 50 mph
Potential Cause(s): Factors contributing to the congestion were:
1) traffic entering at the interchanges along this corridor; 2) the geometrics of the road (sharp bends) and; 3) the weaving associated with the I-75/I-85 split.

H

Congestion Type: Mainline Congestion
Frequency: Most Observations
Direction: Southbound
Location: Between the I-75/I-85 merge and I-20
Queue Length: 4 to 6 miles
Estimated Speed: 5 to 35 mph
Potential Cause(s): Factors contributing to the congestion were:
1) the geometrics of the road (sharp bends) and; 2) merging & weaving associated with the interchanges along this corridor.

I

Congestion Type: Mainline Congestion
Frequency: Most observations before 6:00 p.m.
Direction: Southbound
Location: Between I-285 and Forest Parkway
Queue Length: 1 to 2 miles
Estimated Speed: 25 to 50 mph
Potential Cause(s): Factors contributing to the congestion were:
1) the series of lane drops (5 lanes to 4 and 4 lanes to 3) in the vicinity of the I-285 interchange and; 2) traffic entering from I-285.

J

Congestion Type: Mainline Congestion
Frequency: Most Observations
Direction: Southbound
Location: Between SR 138 and Jodeco Rd
Queue Length: 4 to 6 miles
Estimated Speed: 30 to 50 mph
Potential Cause(s): Traffic entering at the I-675 and Hudson Bridge Rd interchanges

K

Congestion Type: Exit Ramp Queue
Location: SR 20
Frequency: Intermittent
Direction: Southbound
Queue Population: 20 to 40 vpl

L

Congestion Type: Exit Ramp Queue
Location: SR 155
Frequency: Most Observations
Direction: Southbound
Queue Population: 20 to 35 vpl
Number of Lanes: 2

SA

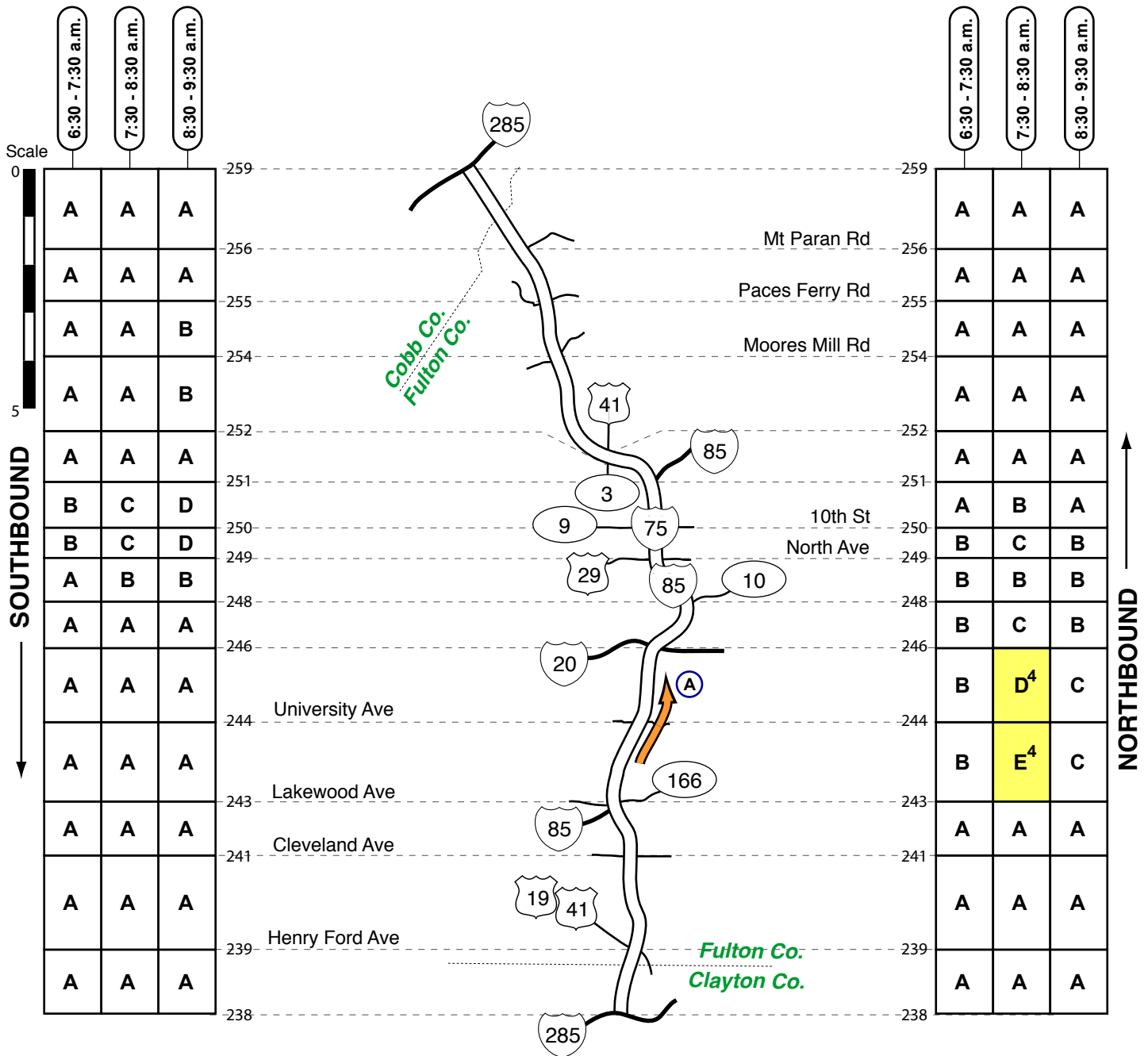
Congestion Type: Surveyed Cross Road Signal Queue
Location: SR 54
Frequency: Peak Hour
Direction: Southbound
Queue Population: 20 to 30 vpl
Number of Lanes: 2
Note: The SR 54 / I-75 Interchange was under construction during the 2010 aerial survey.

SB

Congestion Type: Surveyed Cross Road Signal Queue
Location: SR 20
Frequency: Intermittent
Direction: Northbound
Queue Population: 20 to 30 vpl
Number of Lanes: 2

SC

Congestion Type: Surveyed Cross Road Signal Queue
Location: SR 155
Frequency: Most Observations
Direction: Northbound
Queue Population: 20 to 30 vpl
Number of Lanes: 1

I-75 HOV (Cobb/Fulton & Clayton Counties) - Morning

A

Congestion Type: HOV Congestion

Frequency: Peak Hour

Direction: Northbound

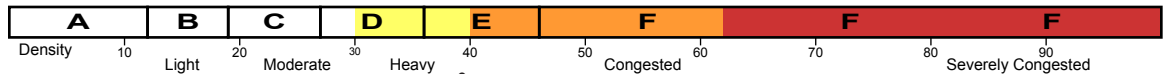
Location: Between SR 166 and I-20

Queue Length: 1 to 2 miles

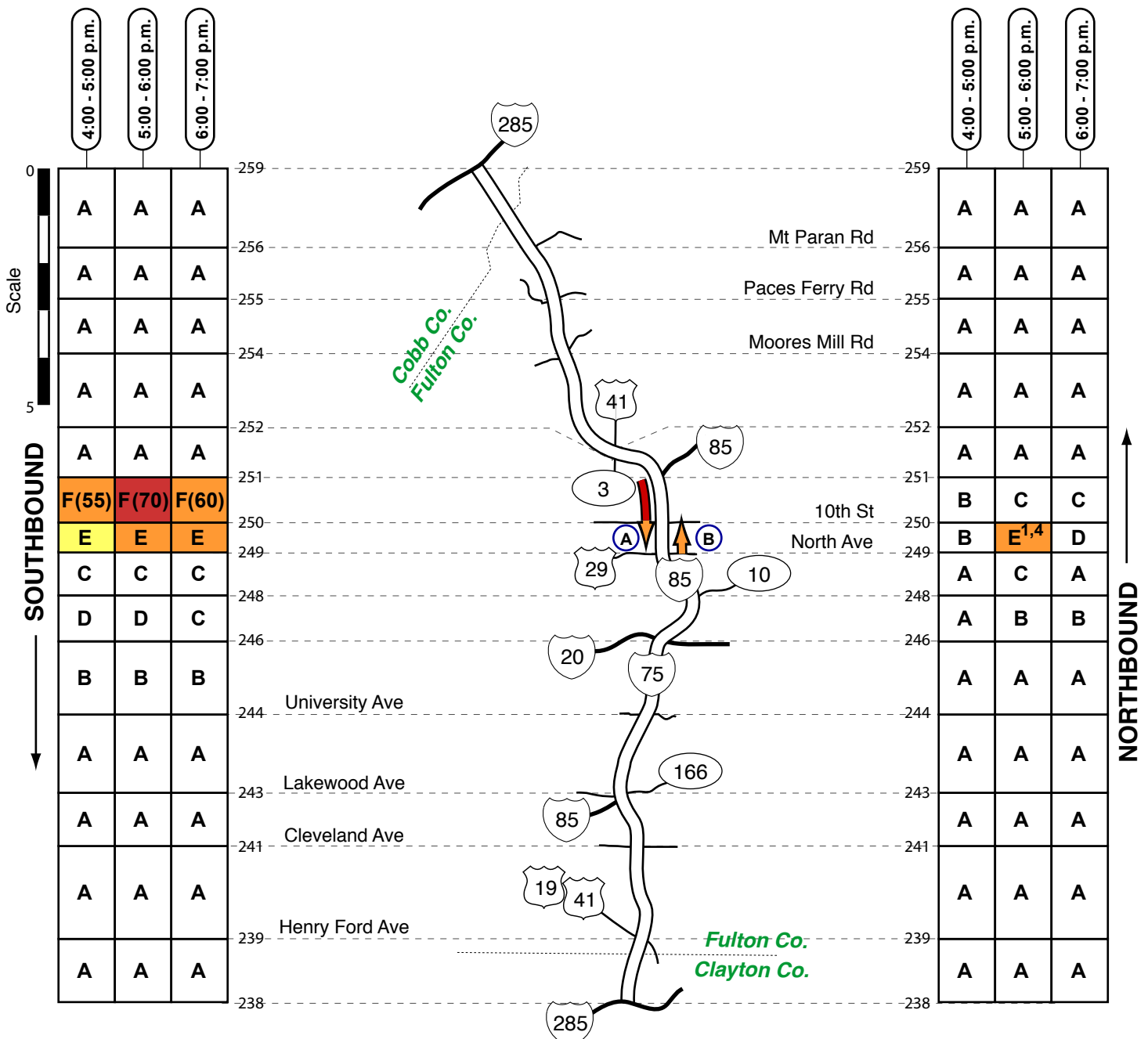
Estimated Speed: 40 to 50 mph

Potential Cause(s): Friction between the congested 'general-purpose' lanes and the HOV facility

Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

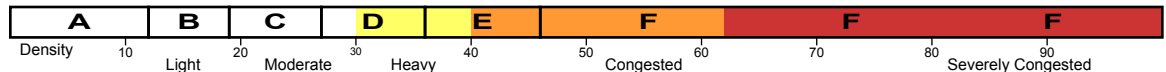
I-75 HOV (Cobb/Fulton & Clayton Counties) - Evening



A
 Congestion Type: HOV Congestion
 Frequency: Most Observations
 Direction: Southbound
 Location: Between the I-75/I-85 split and North Ave
 Queue Length: 1 to 2 miles
 Estimated Speed: 20 to 50 mph
 Potential Cause(s): Factors contributing to the congestion were:
 1) the lane drop (2 lanes to 1) where the I 75 and I-85 HOV facilities merge and; 2) friction between the congested 'general-purpose' lanes and the HOV facility.

B
 Congestion Type: HOV Congestion
 Frequency: Peak Hour
 Direction: Northbound
 Location: Between North Ave and 10th St
 Queue Length: 0.5 to 1 miles
 Estimated Speed: 40 to 50 mph
 Potential Cause(s): Friction between the 'general-purpose' lanes and the HOV facility

Traffic Quality Rating



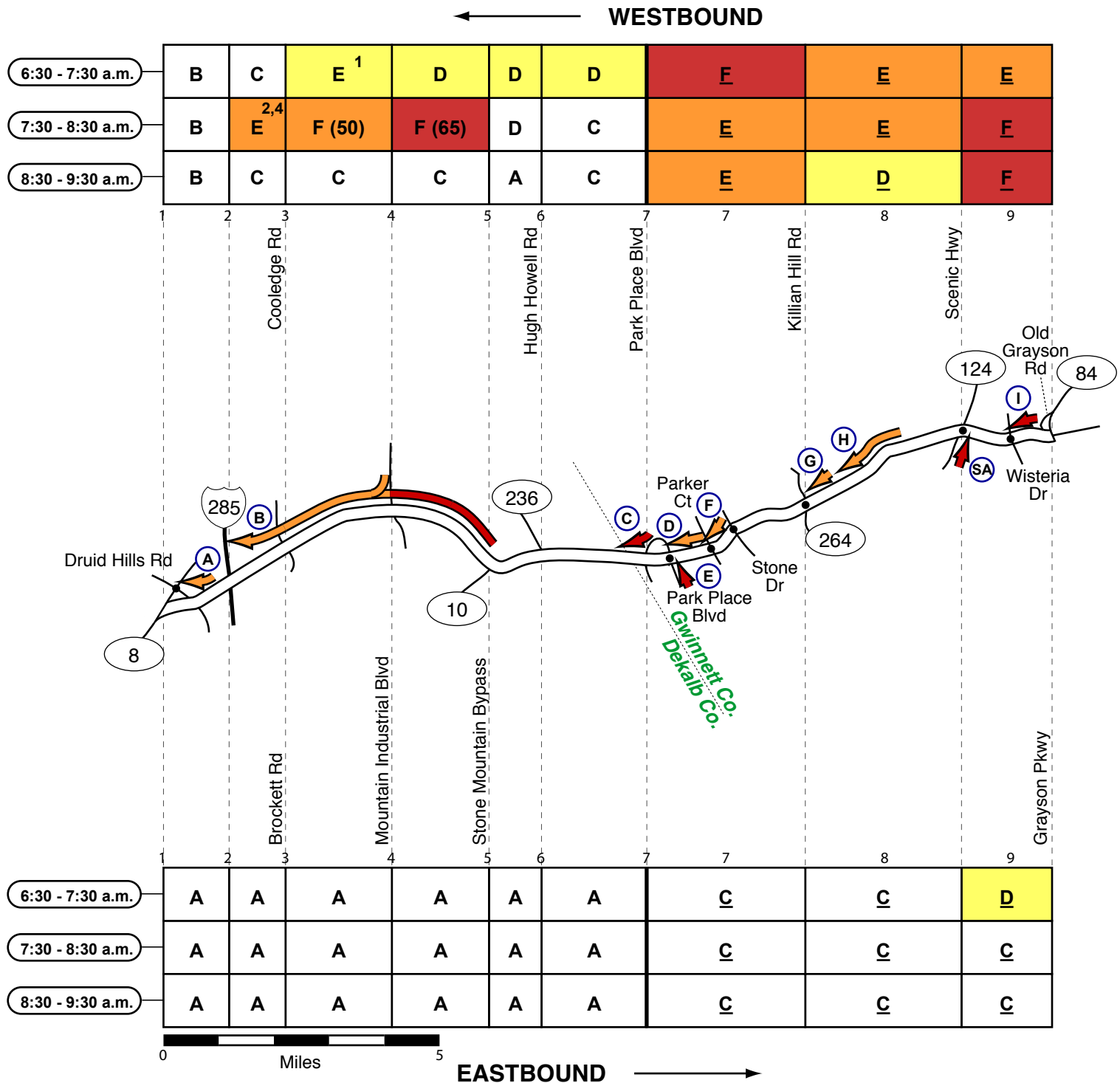
Superscripts: ¹ Type 1 nested congestion (some days, not others).

² Type 2 nested congestion (more severe in left or right-hand lanes).

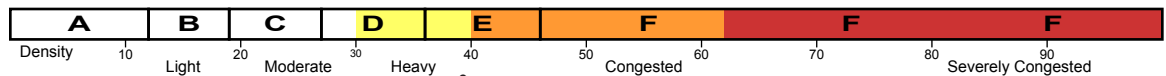
³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).

US 78 (DeKalb & Gwinnett Counties) - Morning



Traffic Quality Rating



Superscripts: ¹ Type 1 nested congestion (some days, not others).

²Type 2 nested congestion (more severe in left or right-hand lanes).

³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴Type 4 nested congestion (partial length of segment).

US 78 (DeKalb & Gwinnett Counties) - Morning

A

Congestion Type: Exit Ramp Queue
 Location: Druid Hills Rd
 Frequency: Intermittent
 Direction: Westbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

B

Congestion Type: Mainline Congestion
 Frequency: Peak Hour
 Direction: Westbound
 Location: SR 10 and I-285
 Queue Length: 4 to 5 miles
 Estimated Speed: 30 to 50 mph
 Potential Cause(s): Factors contributing to the congestion included: 1) congestion on the ramp to northbound I-285 backed into the right two lanes on US 78 and ultimately across all three lanes; 2) traffic entering the mainline at Stone Mountain Industrial Blvd and; 3) the weaving associated with the SR 10/US 78 split.

C

Congestion Type: Entrance Ramp Queue
 Location: Park Place Blvd
 Frequency: Peak Hour
 Direction: Westbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2
 Note: The head of the queue was found at the ramp meter.

D

Congestion Type: Mainline Signal Queue
 Location: Park Place Blvd
 Frequency: Intermittent
 Direction: Westbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 3

E

Congestion Type: Cross Road Signal Queue
 Location: Park Place Blvd
 Frequency: Peak Hour
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2
 Note: The head of the queue was found in the two left-turn lanes at the signal; congestion typically extended back into the mainline of Park Place Blvd.

F

Congestion Type: Mainline Signal Queue
 Location: Parker Ct
 Frequency: Intermittent
 Direction: Westbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 3

G

Congestion Type: Mainline Signal Queue
 Location: SR 264
 Frequency: Intermittent
 Direction: Westbound
 Queue Population: 20 to 50 vpl
 Number of Lanes: 3

H

Congestion Type: Platoons
 Location: Between SR 124 & SR 264
 Frequency: Intermittent
 Direction: Westbound
 Platoon Population: 25 to 35 vpl
 Number of Lanes: 3

I

Congestion Type: Mainline Signal Queue
 Location: Wisteria Dr
 Frequency: Most Observations
 Direction: Westbound
 Queue Population: 30 to 80 vpl
 Number of Lanes: 2
 Note: On three of four days, congestion backed through the upstream signal at Abington Lane

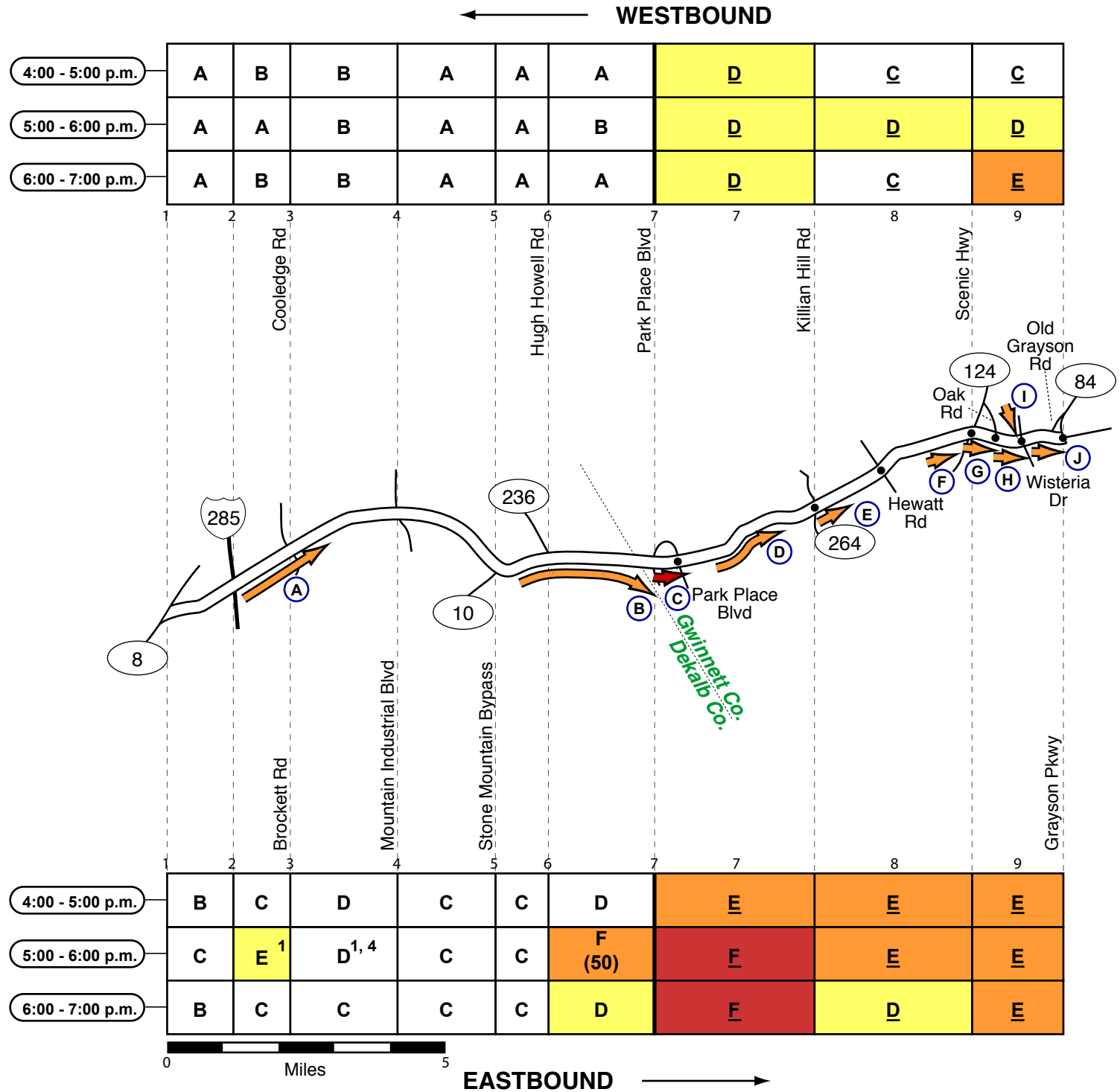
SA

Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 124
 Frequency: Peak Hour
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

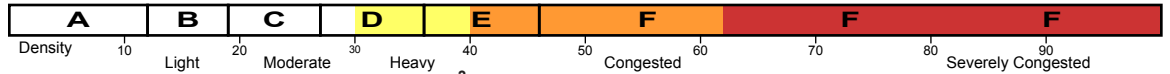
Traffic Quality Rating

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>
Very Light	Light	Moderate	Heavy	Congested	Severe

US 78 (DeKalb & Gwinnett Counties) - Evening



Traffic Quality Rating



Superscripts: ¹ Type 1 nested congestion (some days, not others).

² Type 2 nested congestion (more severe in left or right-hand lanes).

³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).

US 78 (DeKalb & Gwinnett Counties) - Evening

A

Congestion Type: Mainline Congestion
 Frequency: On two of four surveyed evenings
 Direction: Eastbound
 Location: Between I-285 and Cooledge Rd
 Queue Length: 1 to 1.5 miles
 Estimated Speed: 30 to 50 mph
 Potential Cause(s): Congestion appeared to be caused by traffic entering the mainline from northbound I-285 and the lane drop (4 lanes to 3) at Cooledge Rd.

B

Congestion Type: Mainline Congestion
 Frequency: Peak Hour
 Direction: Eastbound
 Location: Between SR 236 and Park Place Blvd
 Queue Length: 1 to 2 miles
 Estimated Speed: 30 to 50 mph
 Potential Cause(s): Congestion appeared to be exacerbated by vehicles exiting at the service road approximately one-half mile before the Park Place Blvd interchange; weaving on the approach to the exit ramp may have contributed to the congestion.

C

Congestion Type: Mainline Signal Queue
 Location: Park Place Blvd
 Frequency: Most Observations
 Direction: Eastbound
 Queue Population: 20 to 60 vpl
 Number of Lanes: 3

D

Congestion Type: Platoons
 Location: Between E. Park Place Blvd & SR 264
 Frequency: Intermittent
 Direction: Eastbound
 Platoon Population: 25 to 35 vpl
 Number of Lanes: 3

E

Congestion Type: Platoons
 Location: Between SR 264 and SR 124
 Frequency: Intermittent
 Direction: Eastbound
 Platoon Population: 25 to 35 vpl
 Number of Lanes: 3

F

Congestion Type: Mainline Signal Queue
 Location: SR 124
 Frequency: One time only
 Direction: Eastbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

G

Congestion Type: Mainline Signal Queue
 Location: Oak Rd
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

H

Congestion Type: Mainline Signal Queue
 Location: Wisteria Dr
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

I

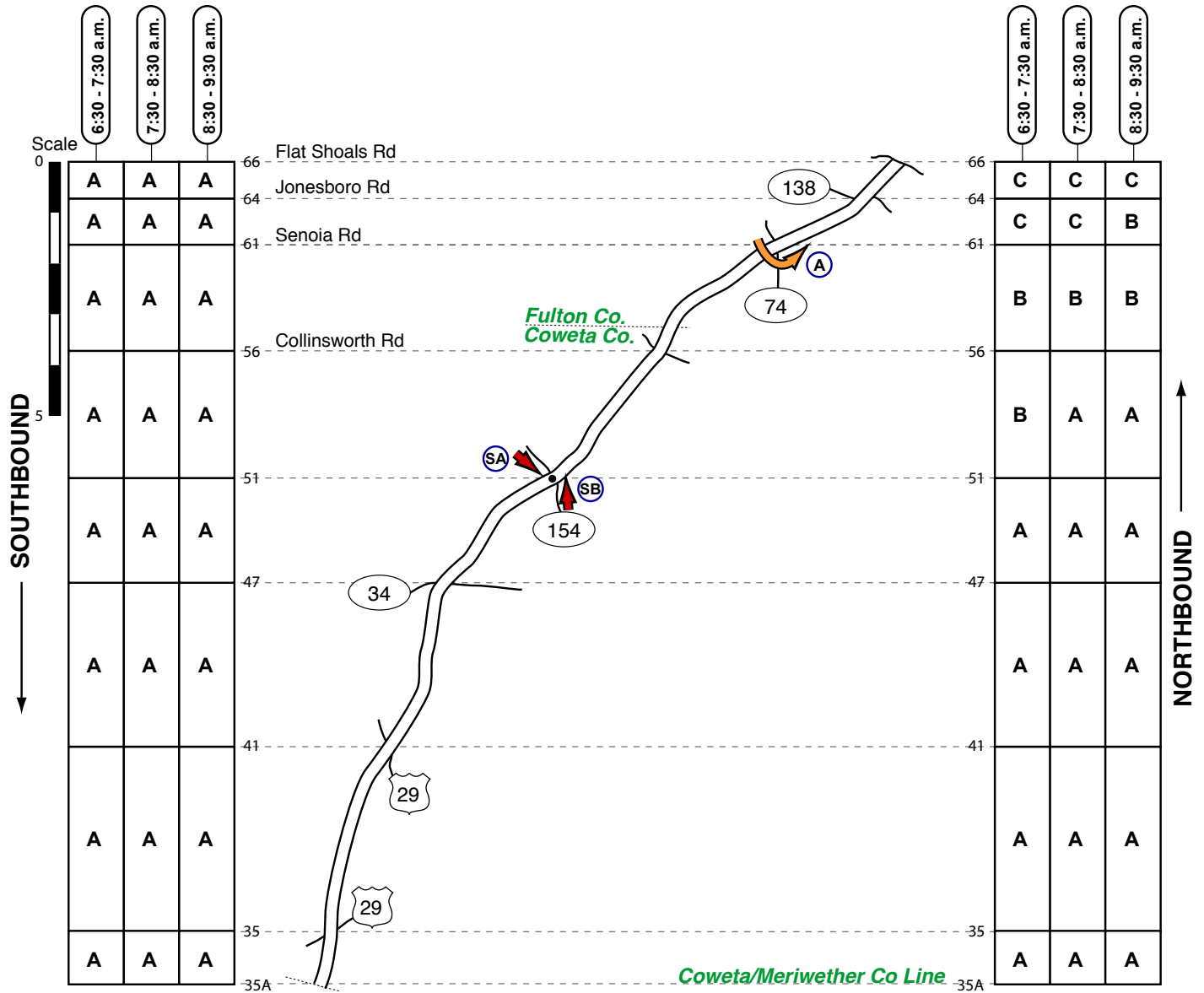
Congestion Type: Cross Road Signal Queue
 Location: Wisteria Dr
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

J

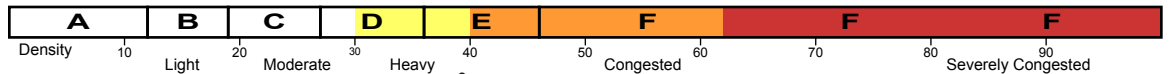
Congestion Type: Mainline Signal Queue
 Location: SR 84
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

Traffic Quality Rating

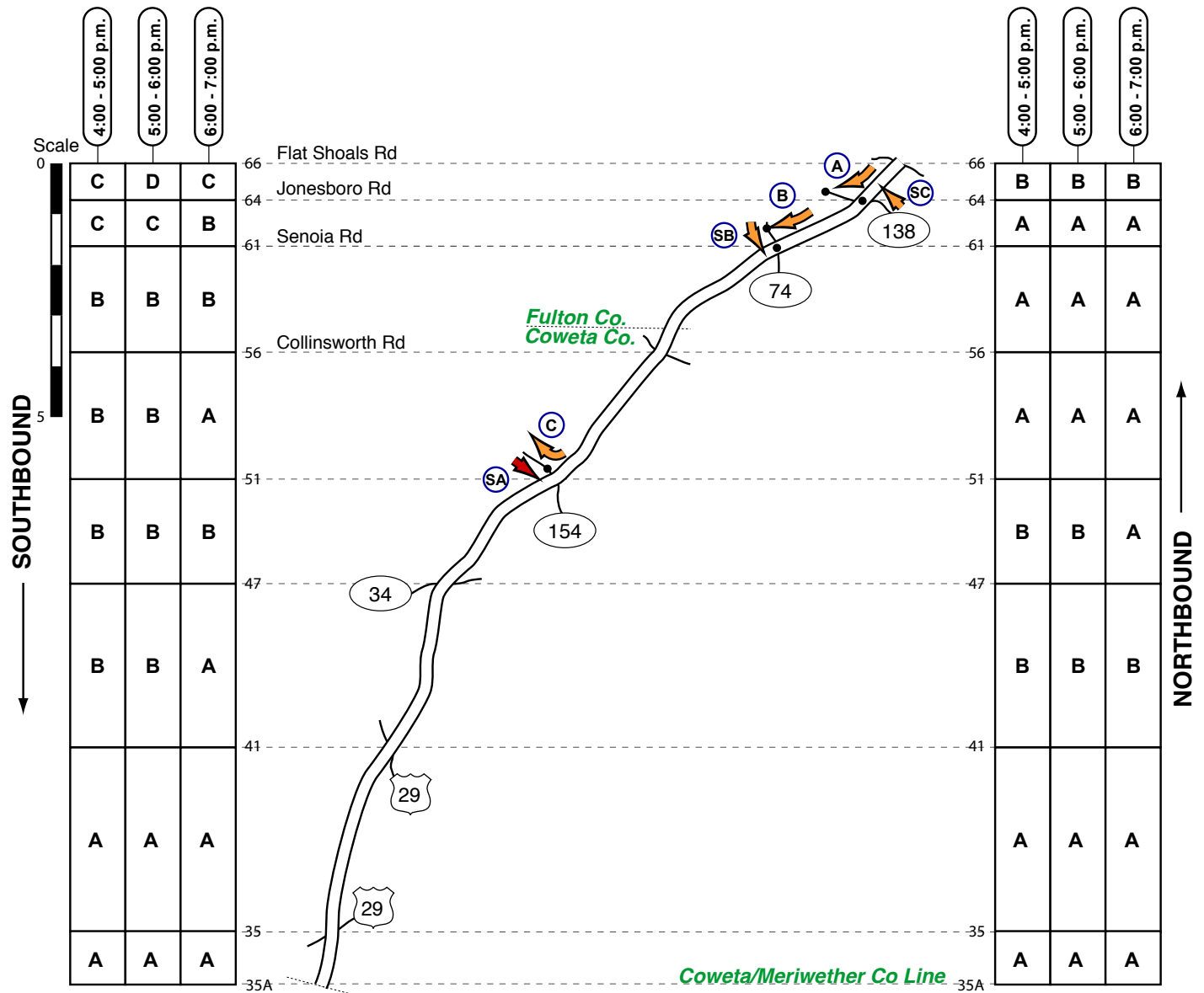
<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>
Very Light	Light	Moderate	Heavy	Congested	Severe

I-85 (Fulton & Coweta Counties) - Morning

Traffic Quality Rating

**Superscripts:** ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

I-85 (Fulton & Coweta Counties) - Evening



A
 Congestion Type: Exit Ramp Queue
 Location: SR 138
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

B
 Congestion Type: Exit Ramp Queue
 Location: SR 74
 Frequency: One time only
 Direction: Southbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 2
 Note: Congestion was found in the two left-turn lanes.

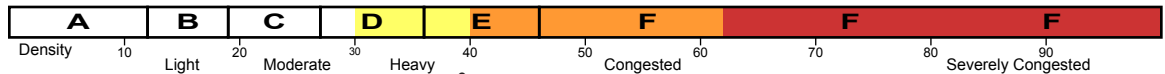
C
 Congestion Type: Exit Ramp Queue
 Location: SR 154
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1
 Note: Congestion was found in the left-turn lane at the signal at the head of the ramp.

SA
 Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 154
 Frequency: Most observations
 Direction: Southbound
 Queue Population: 20 to 35 vpl
 Number of Lanes: 1

SB
 Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 74
 Frequency: Intermittent
 Direction: Southbound
 Population: 20 to 35 vpl
 Number of Lanes: 2

SC
 Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 138
 Frequency: Intermittent
 Direction: Westbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

Traffic Quality Rating



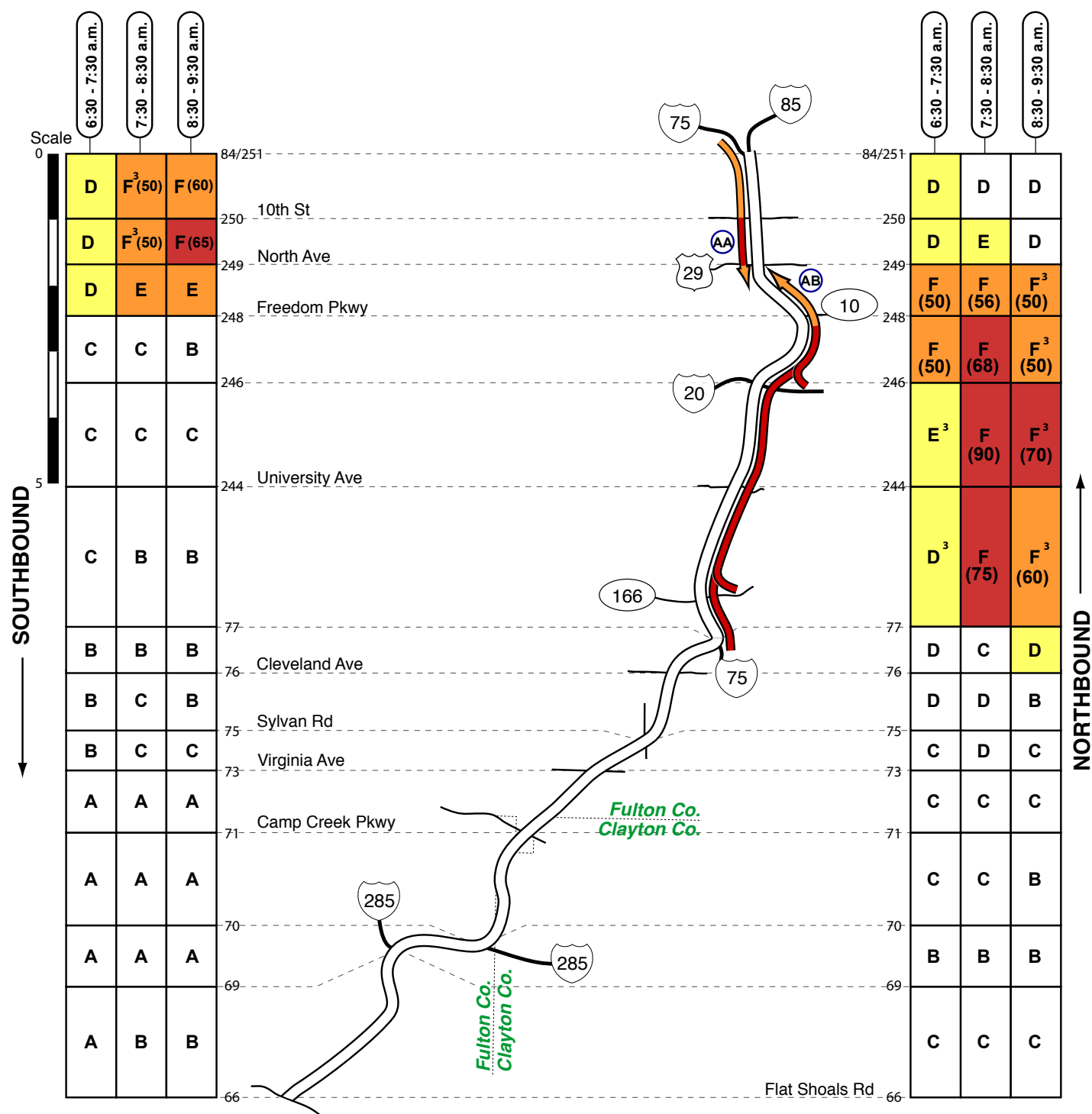
Superscripts: ¹ Type 1 nested congestion (some days, not others).

² Type 2 nested congestion (more severe in left or right-hand lanes).

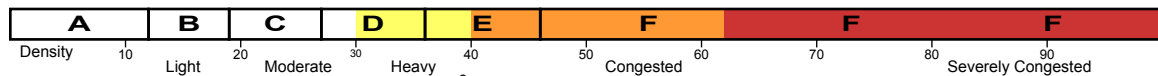
³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).

I-85 (Fulton & Clayton Counties) - Morning



Traffic Quality Rating



Superscripts: ¹ Type 1 nested congestion (some days, not others).

²Type 2 nested congestion (more severe in left or right-hand lanes).

³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴Type 4 nested congestion (partial length of segment).

I-85 (Fulton & Clayton Counties) - Morning

AA

Congestion Type: Mainline Congestion

Frequency: On two of four surveyed mornings after 8:00 a.m.

Direction: South-eastbound

Location: Between the I-75/I-85 merge and SR 10

Queue Length: 1 to 2 miles

Estimated Speed: 15 to 50 mph

Potential Cause(s): The head of the queue was found at the signal at the head of the Exit 249C ramp; congestion on the two lane ramp extended back into the right lanes (and eventually across all lanes of I-75/I-85).

AB

Congestion Type: Mainline Congestion

Frequency: Most observations between 7:00 and 9:00 a.m.

Direction: Northbound

Location: Between SR 166 and US 29

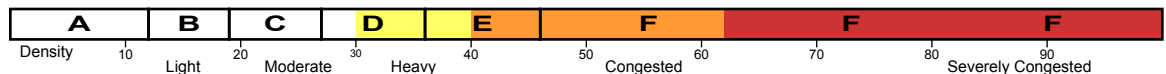
Queue Length: 4 to 5 miles

Estimated Speed: 15 to 35 mph

Potential Cause(s): Factors contributing to the congestion were:

1) traffic entering at the SR 166 and I-20 interchanges and; 2) the two separate lane drops approaching the I-20 interchange (6 lanes to 5 and 5 lanes to 4).

Traffic Quality Rating



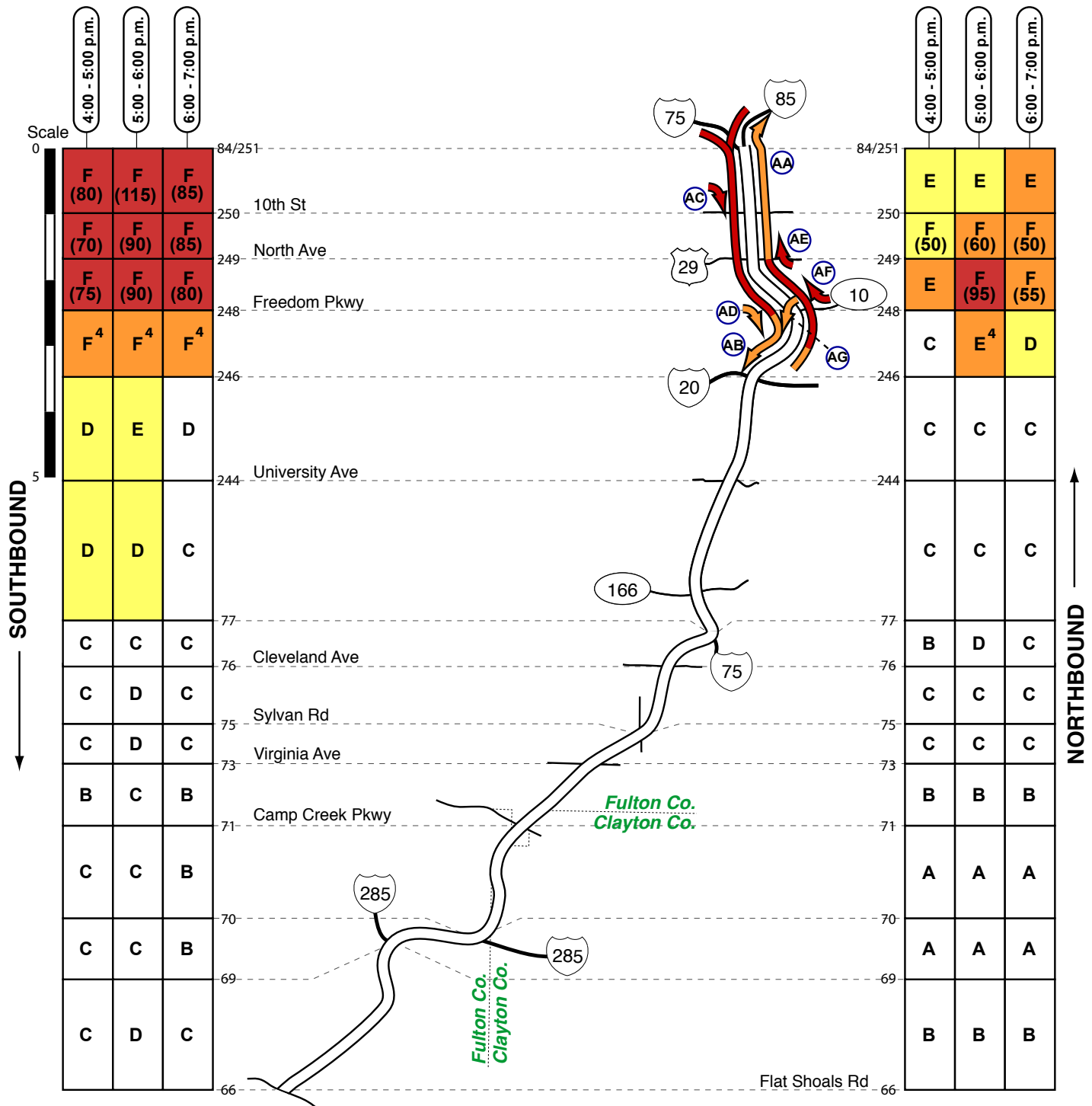
Superscripts: ¹ Type 1 nested congestion (some days, not others).

² Type 2 nested congestion (more severe in left or right-hand lanes).

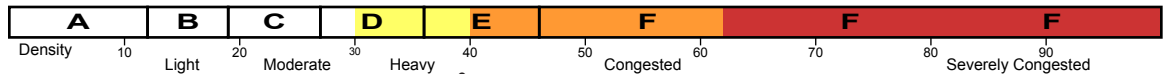
³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).

I-85 (Fulton & Clayton Counties) - Evening



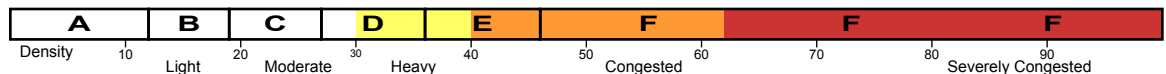
Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

I-85 (Fulton & Clayton Counties) - Evening

<p>AA Congestion Type: Mainline Congestion Frequency: Most Observations Direction: Northbound Location: Between I-20 and the I-75/I-85 split Queue Length: 2 to 4 miles Estimated Speed: 15 to 50 mph Potential Cause(s): Factors contributing to the congestion were: 1) traffic entering at the interchanges along this corridor; 2) the geometrics of the road (sharp bends) and; 3) the weaving associated with the I-75/I-85 split.</p>	<p>AG Congestion Type: Entrance Ramp Queue Location: SR 10 (Freedom Parkway) Frequency: Intermittent Direction: Southbound Queue Population: 25 to 45 vpl Number of Lanes: 2 Note: The head of the queue was found at the ramp meter.</p>
<p>AB Congestion Type: Mainline Congestion Frequency: Most Observations Direction: Southbound Location: Between the I-75/I-85 merge and I-20 Queue Length: 4 to 6 miles Estimated Speed: 5 to 35 mph Potential Cause(s): Factors contributing to the congestion were: 1) the geometrics of the road (sharp bends) and; 2) merging & weaving associated with the interchanges along this corridor.</p>	
<p>AC Congestion Type: Exit Ramp/Frontage Rd Queue Location: 10th St Frequency: Most observations after 5:00 p.m. Direction: Southbound Queue Population: 20 to 40 vpl Number of Lanes: 3 Note: Congestion was typically limited to the left and thru-lanes.</p>	
<p>AD Congestion Type: Entrance Ramp Queue Location: Ellis St Frequency: Intermittent Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2</p>	
<p>AE Congestion Type: Entrance Ramp Queue Location: Ivan Allen Jr Blvd / Spring Techwood Connector Frequency: Most observations after 5:00 p.m. Direction: Northbound Queue Population: 40 to 70 vpl Number of Lanes: 2</p>	
<p>AF Congestion Type: Entrance Ramp Queue Location: SR 10 (Freedom Parkway) Frequency: Most observations after 5:00 p.m. Direction: Northbound Queue Population: 20 to 60 vpl Number of Lanes: 2</p>	

Traffic Quality Rating



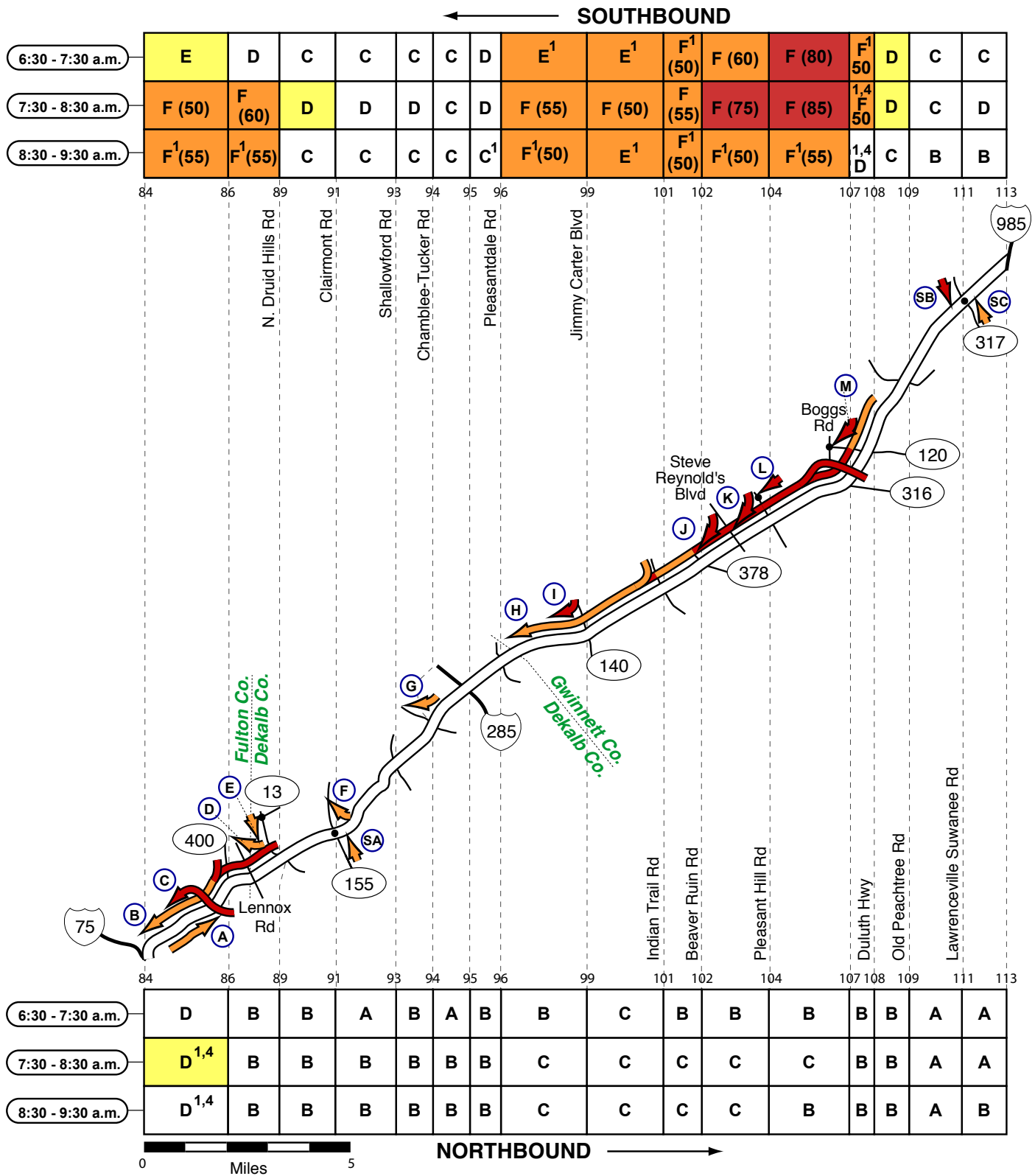
Superscripts: ¹ Type 1 nested congestion (some days, not others).

² Type 2 nested congestion (more severe in left or right-hand lanes).

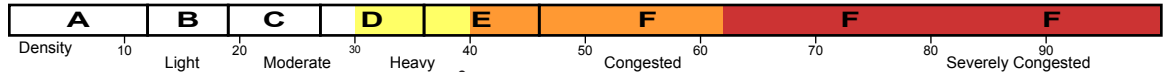
³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).

I-85 (Fulton/Dekalb & Gwinnett Counties) - Morning



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-85 (Fulton/Dekalb & Gwinnett Counties) - Morning

A

Congestion Type: Mainline Congestion
 Frequency: One day only
 Direction: Northbound
 Location: Between I-75 and SR 400
 Queue Length: 0.5 to 1 miles
 Estimated Speed: 40 to 50 mph
 Potential Cause(s): Factors that may have exacerbated the congestion included: 1) the weaving associated with the SR 400 interchange and; 2) sun glare.

B

Congestion Type: Mainline Congestion
 Frequency: Most observations after 7:30 a.m.
 Direction: Southbound
 Location: Between Druid Hills Rd and I-75
 Queue Length: 3 to 5 miles
 Estimated Speed: 20 to 50 mph
 Potential Cause(s): The primary bottleneck along this section of I-85 was found where traffic entered the mainline at SR 400; upstream of the merge, average estimated speeds were typically less than 30 mph. While congestion persisted south of SR 400, average speeds typically improved (40-50 mph).

C

Congestion Type: Entrance Ramp Queue
 Location: SR 13
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 25 to 45 vpl
 Number of Lanes: 1

D

Congestion Type: Exit Ramp Queue
 Location: Lenox Rd
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 25 to 35 vpl
 Number of Lanes: 1
 Note: Congestion was found in the right-turn lane.

E

Congestion Type: Entrance Ramp Queue
 Location: N. Druid Hills Rd
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2
 Note: The head of the queue was found at the ramp meter.

F

Congestion Type: Exit Ramp/Frontage Rd Queue
 Location: SR 155 (Clairmont Rd)
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 3

G

Congestion Type: Exit Ramp Queue
 Location: Chamblee-Tucker Rd
 Frequency: One time only
 Direction: Southbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 2

H

Congestion Type: Mainline Congestion
 Frequency: Most Observations
 Direction: Southbound
 Location: Between SR 120 and I-285
 Queue Length: 10 to 13 miles
 Estimated Speed: 15 to 50 mph
 Potential Cause(s): The primary bottlenecks were where traffic entered at Steve Reynold's Blvd and SR 316; while congestion persisted south of Steve Reynold's Blvd, traffic flow typically improved.

I

Congestion Type: Entrance Ramp Queue
 Location: SR 140 (Jimmy Carter Blvd)
 Frequency: Most Observations
 Direction: Southbound
 Queue Population: 20 to 50 vpl
 Number of Lanes: 2
 Note: The head of the queue was found at the ramp meter.

J

Congestion Type: Entrance Ramp Queue
 Location: Steve Reynolds Blvd
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 30 to 60 vpl
 Number of Lanes: 1
 Note: The head of the queue was found at the merge onto I-85; congestion backed through the ramp meter.

K

Congestion Type: Entrance Ramp Queue
 Location: Pleasant Hill Rd
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 30 to 40 vpl
 Number of Lanes: 1

L

Congestion Type: Frontage Rd Queue
 Location: Pleasant Hill Rd
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 30 to 60 vpl
 Number of Lanes: 2
 Note: Congestion was found in the two left-turn lanes

M

Congestion Type: Exit Ramp/Frontage Rd Queue
 Location: Boggs Rd
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 25 to 35 vpl
 Number of Lanes: 2

SA

Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 155
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 1
 Note: When congested, vehicles were queued in the dedicated left- turn lane at the signal at I-85 (left-turning vehicles access I-85 southbound).

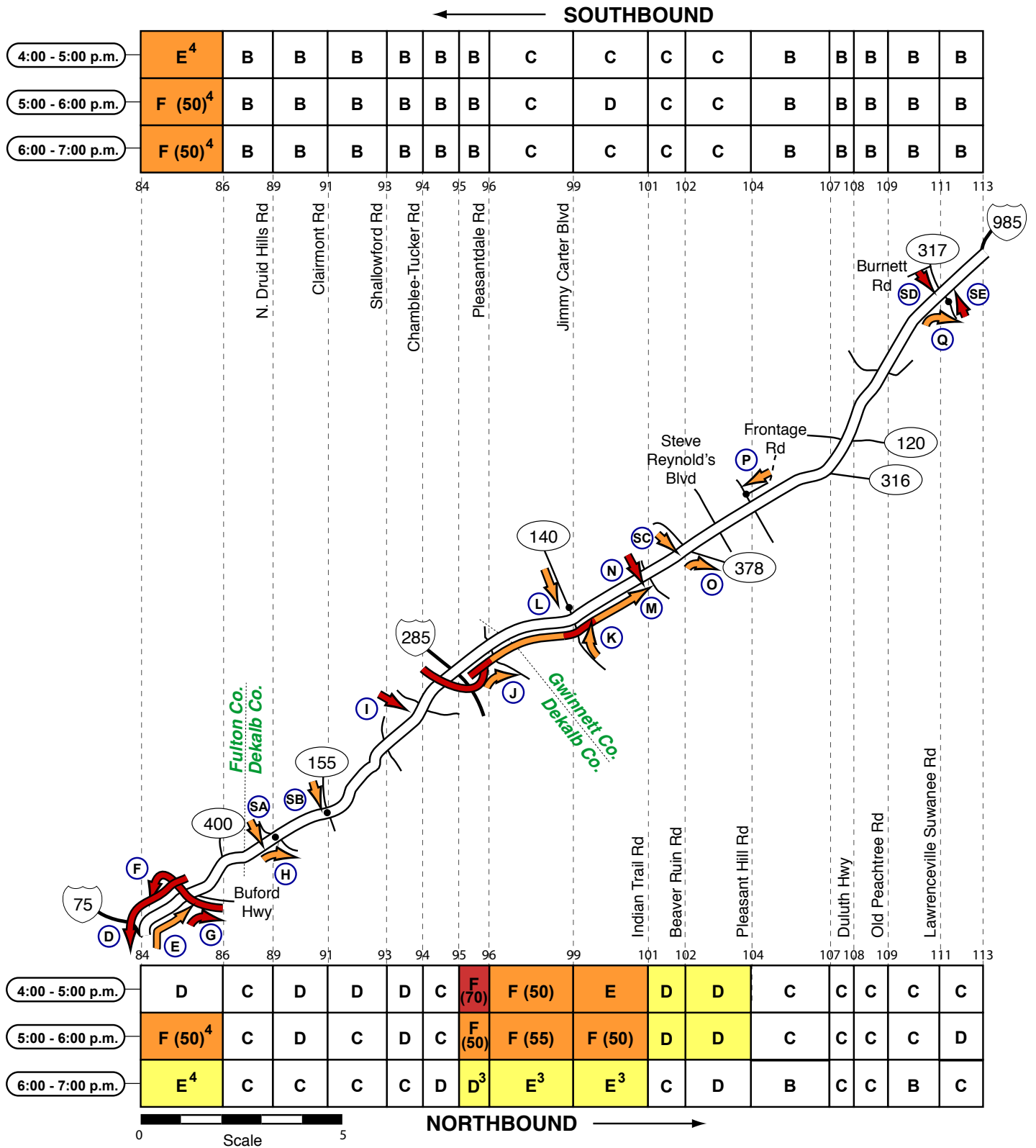
SB

Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 317
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2
 Note: The head of the queue was found at one of the two closely spaced signals at Burnette Rd and I-85.

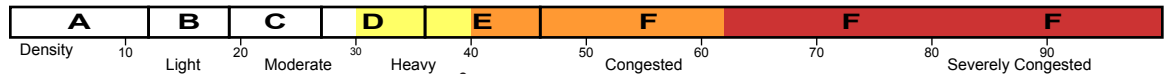
SC

Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 317
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

I-85 (Fulton/Dekalb & Gwinnett Counties) - Evening

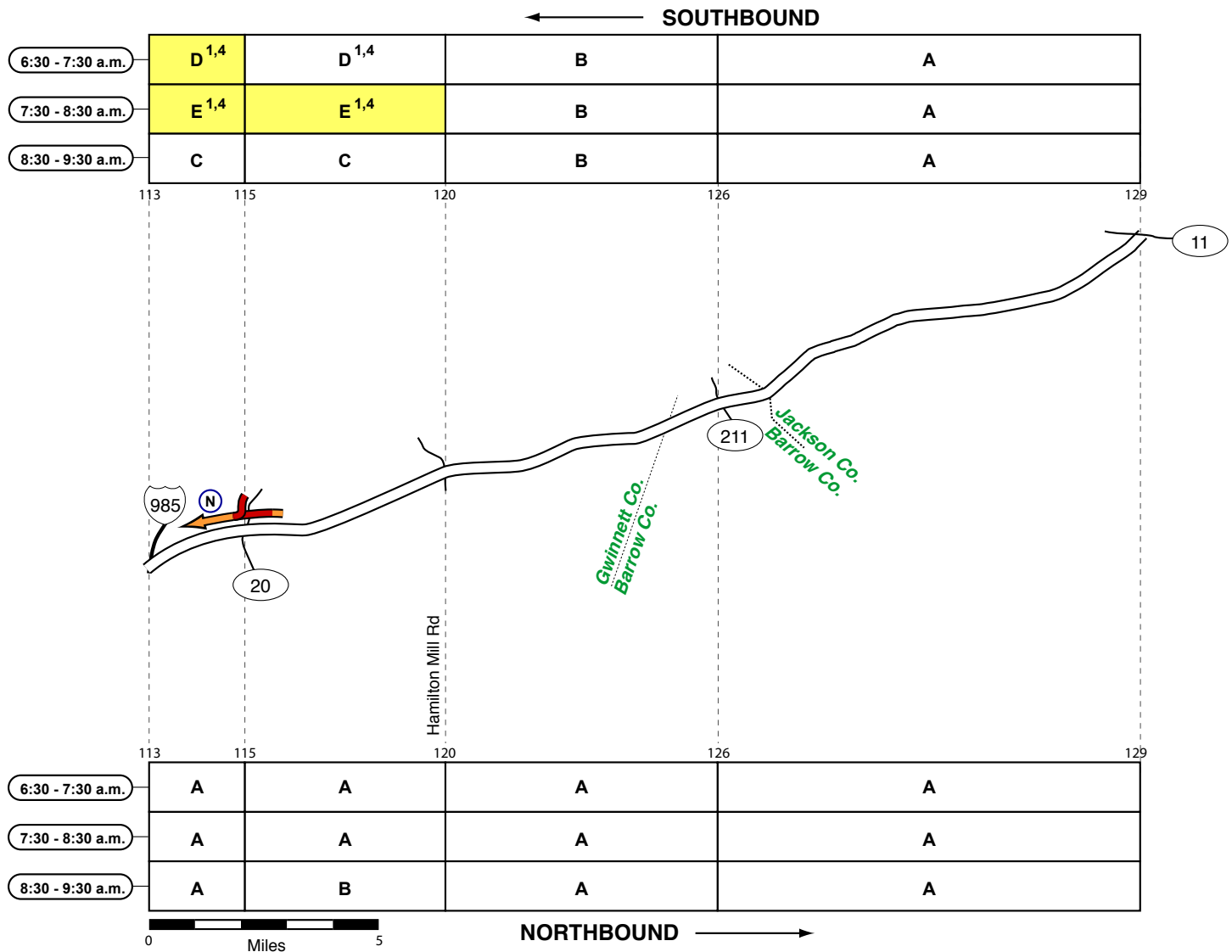


Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-85 (Fulton/Dekalb & Gwinnett Counties) - Evening

<p>D Congestion Type: Mainline Congestion Frequency: Most Observations Direction: Southbound Location: Between SR 400 and the I-75/I-85 merge Queue Length: 2 to 3 miles Estimated Speed: 20 to 50 mph Potential Cause(s): The head of the queue was found downstream on I-75/I-85. On some days but not others, congestion extended back into the mainline of SR 13 (Buford Highway)</p>	<p>J Congestion Type: Frontage Rd Queue Location: Pleasant Hill Rd Frequency: One day only Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2 Note: Congestion was found in the two left-turn lanes at the signal.</p>	<p>Q Congestion Type: Exit Ramp Queue Location: SR 317 Frequency: Intermittent Direction: Northbound Queue Population: 20 to 30 vpl Number of Lanes: 2 Note: Congestion was found in the two left-turn lanes.</p>
<p>E Congestion Type: Mainline Congestion Frequency: Most observations after 5:00 p.m. Direction: Northbound Location: Between the I-75/I-85 split and SR 400 Queue Length: 1 to 2 miles Estimated Speed: 40 to 50 mph Potential Cause(s): The merging associated with traffic exiting at SR 13 (Buford Highway).</p>	<p>K Congestion Type: Entrance Ramp Queue Location: SR 140 (Jimmy Carter Blvd) Frequency: Intermittent Direction: Northbound Queue Population: 20 to 40 vpl Number of Lanes: 1</p>	<p>SA Congestion Type: Surveyed Cross Road Signal Queue Location: Druid Hills Rd Frequency: Intermittent Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2</p>
<p>F Congestion Type: Entrance Ramp Queue Location: SR 13 Frequency: Most Observations Direction: Southbound Queue Population: 30 to 50 vpl Number of Lanes: 1</p>	<p>L Congestion Type: Cross Road Signal Queue Location: SR 140 (Jimmy Carter Blvd) Frequency: Intermittent Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2</p>	<p>SB Congestion Type: Surveyed Cross Road Signal Queue Location: SR 155 Frequency: Intermittent Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2</p>
<p>G Congestion Type: Exit Ramp Queue Location: SR 13 Frequency: Peak Hour Direction: Northbound Queue Population: 20 to 50 vpl Number of Lanes: 1 Note: The head of the queue was found at the merge into congested flow on SR 13.</p>	<p>M Congestion Type: Mainline Congestion Frequency: Most observations before 6:30 p.m. Direction: Northbound Location: Between the Perimeter and Indian Trail Lilburn Rd Queue Length: 5 to 7 miles Estimated Speed: 20 to 50 mph Potential Cause(s): Traffic entering at the interchanges along this corridor.</p>	<p>SC Congestion Type: Surveyed Cross Road Signal Queue Location: SR 378 Frequency: Intermittent Direction: Eastbound Queue Population: 20 to 30 vpl Number of Lanes: 2</p>
<p>H Congestion Type: Exit Ramp Queue Location: N. Druid Hills Rd Frequency: Intermittent Direction: Northbound Queue Population: 20 to 30 vpl Number of Lanes: 2 Note: The head of the queue was found in the two right-turn lanes.</p>	<p>N Congestion Type: Cross Road Signal Queue Location: Indian Trail Lilburn Rd Frequency: Peak Hour Direction: Southbound Queue Population: 30 to 50 vpl Number of Lanes: 1 Note: The head of the queue was found in the left-turn lane at the ramp to I-85 (northbound).</p>	<p>SD Congestion Type: Surveyed Cross Road Signal Queue Location: SR 317 Frequency: Most Observations Direction: Southbound Queue Population: 50 to 100 vpl Number of Lanes: 2 Note: During the peak period, southbound congestion approaching the signal at I-85 typically backed through the signal at Satellite Blvd (a distance of approximately 1/2 mile).</p>
<p>I Congestion Type: Cross Road Signal Queue Location: Chamblee-Tucker Rd Frequency: Peak Hour Direction: Eastbound Queue Population: 60 to 70 vpl Number of Lanes: 2</p>	<p>O Congestion Type: Entrance Ramp Queue Location: Beaver Run Rd Frequency: Intermittent Direction: Northbound Queue Population: 20 to 30 vpl Number of Lanes: 1 Note: The head of the queue was found at the ramp meter.</p>	<p>SE Congestion Type: Surveyed Cross Road Signal Queue Location: SR 317 Frequency: Most Observations Direction: Northbound Queue Population: 20 to 50 vpl Number of Lanes: 2 Note: During most observations, northbound congestion on SR 317 approaching the signals at I-85 extended back through the upstream signal at Horizon Dr; congestion was also found in both directions on Horizon Dr approaching the signal at SR 317</p>
	<p>P Congestion Type: Frontage Rd Queue Location: Pleasant Hill Rd Frequency: One day only Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2 Note: Congestion was found in the two left-turn lanes at the signal.</p>	

I-85 (Gwinnett & Barrow Counties) - Morning

N

Congestion Type: Mainline Congestion

Frequency: Most observations between 7:00 and 8:30 a.m.

Direction: Southbound

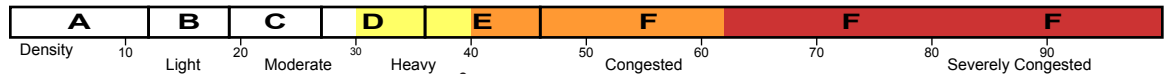
Location: Between Hamilton Mill Rd and SR 20

Queue Length: 1 to 2 miles

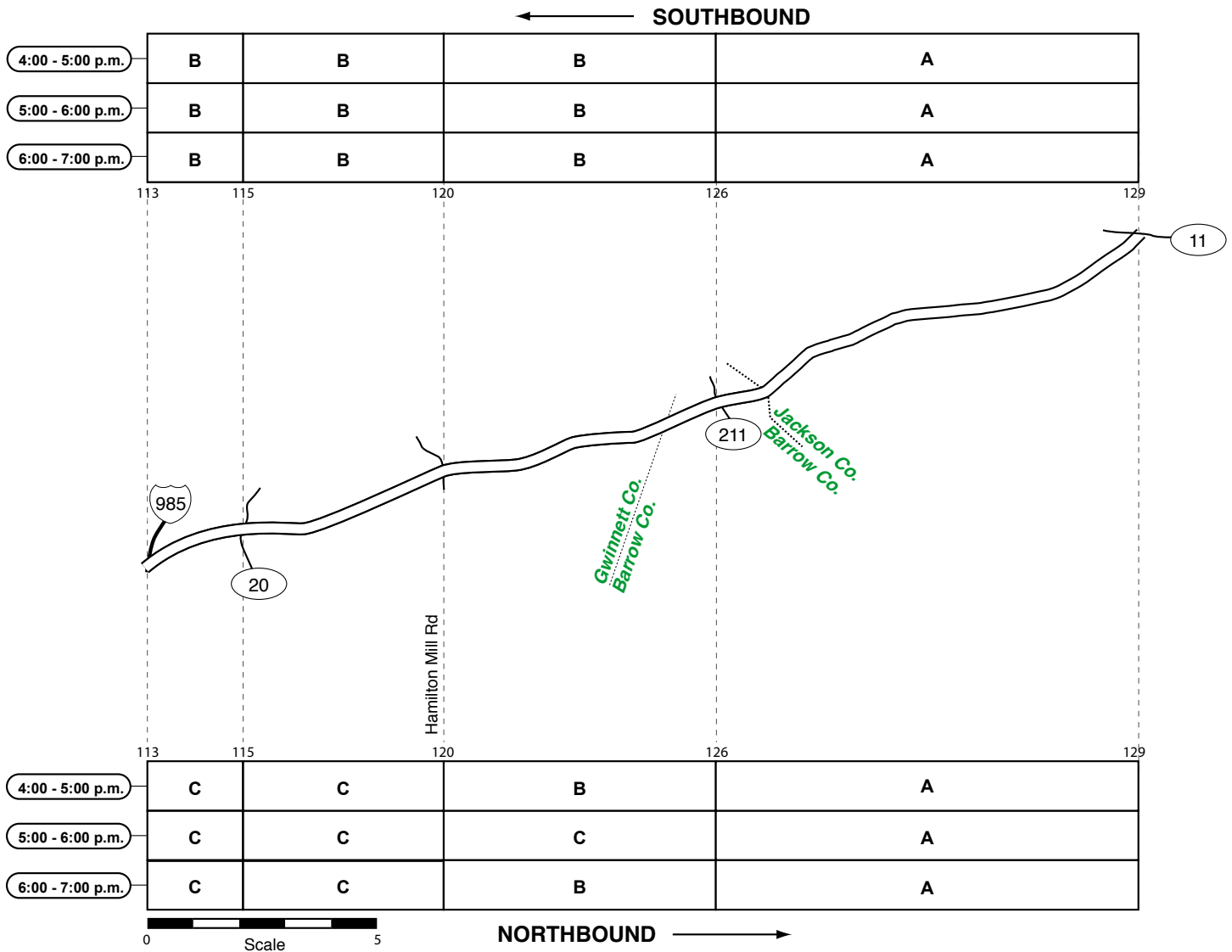
Estimated Speed: 30 to 50 mph

Potential Cause(s): In some cases, stop-and-go congestion was found in the vicinity of the SR 20 Interchange where vehicles merged into the mainline.

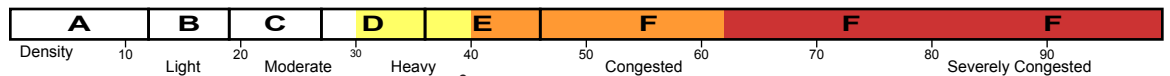
Traffic Quality Rating

**Superscripts:** ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-85 (Gwinnett & Barrow Counties) - Evening



Traffic Quality Rating

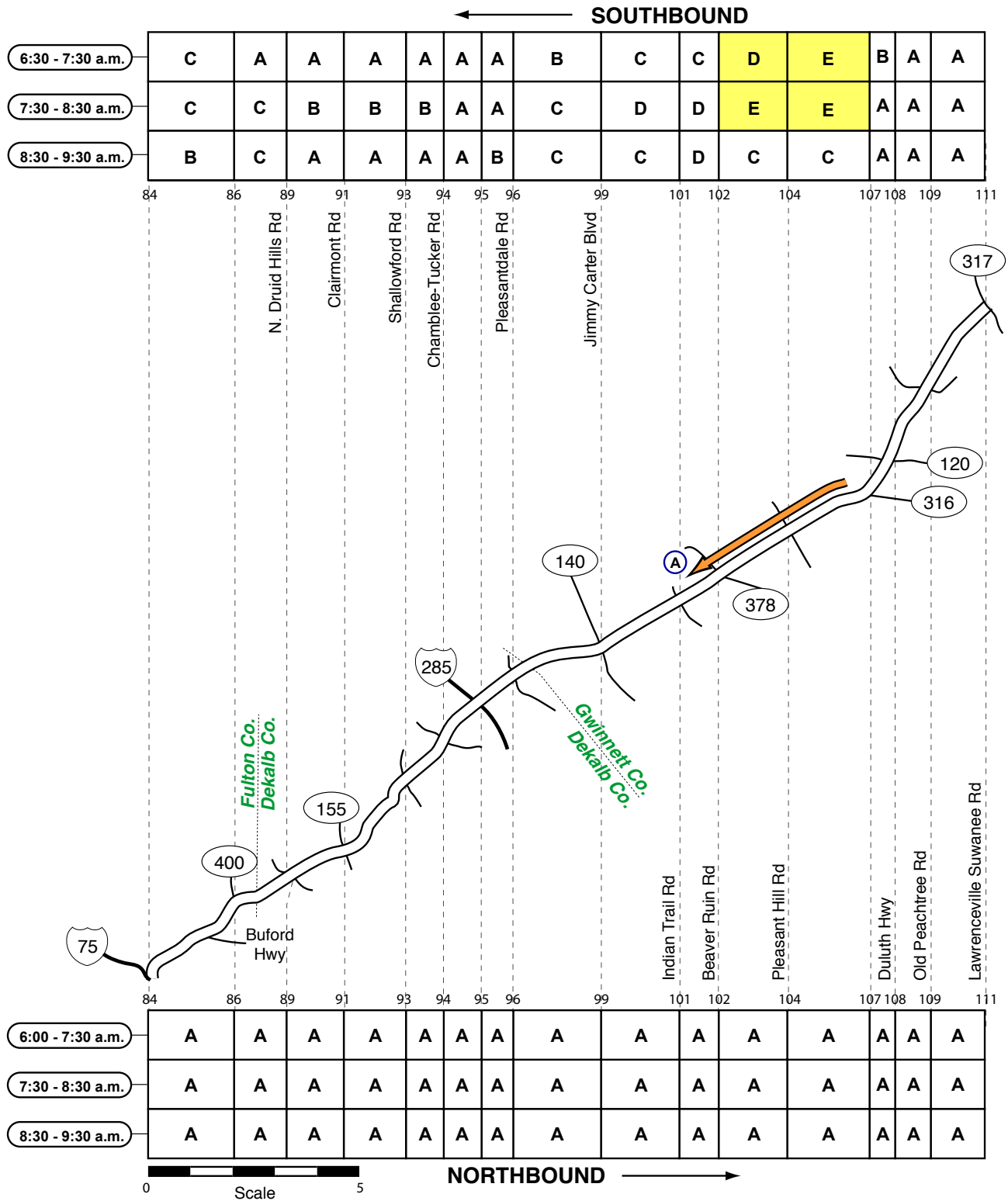


Superscripts: ¹ Type 1 nested congestion (some days, not others).

² Type 2 nested congestion (more severe in left or right-hand lanes).

³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).

I-85 HOV (Fulton/Dekalb & Gwinnett Counties) -Morning

Traffic Quality Rating



Density

10

Light

20

Moderate

30

Heavy

40

50

Congested

60

70

80

Severely Congested

90

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-85 HOV (Fulton/Dekalb & Gwinnett Counties) -Morning

A

Congestion Type: HOV Congestion

Frequency: On some days, but not others

Direction: Southbound

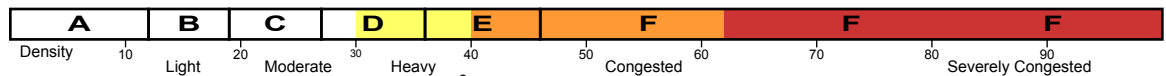
Location: Between SR 316 and Beaver Run Rd

Queue Length: 2 to 5 miles

Estimated Speed: 40 to 50 mph

Potential Cause(s): The primary bottleneck appeared to be where traffic entered from SR 316 on the dedicated HOV ramp; while congestion persisted south of the merge, traffic flow typically improved.

Traffic Quality Rating

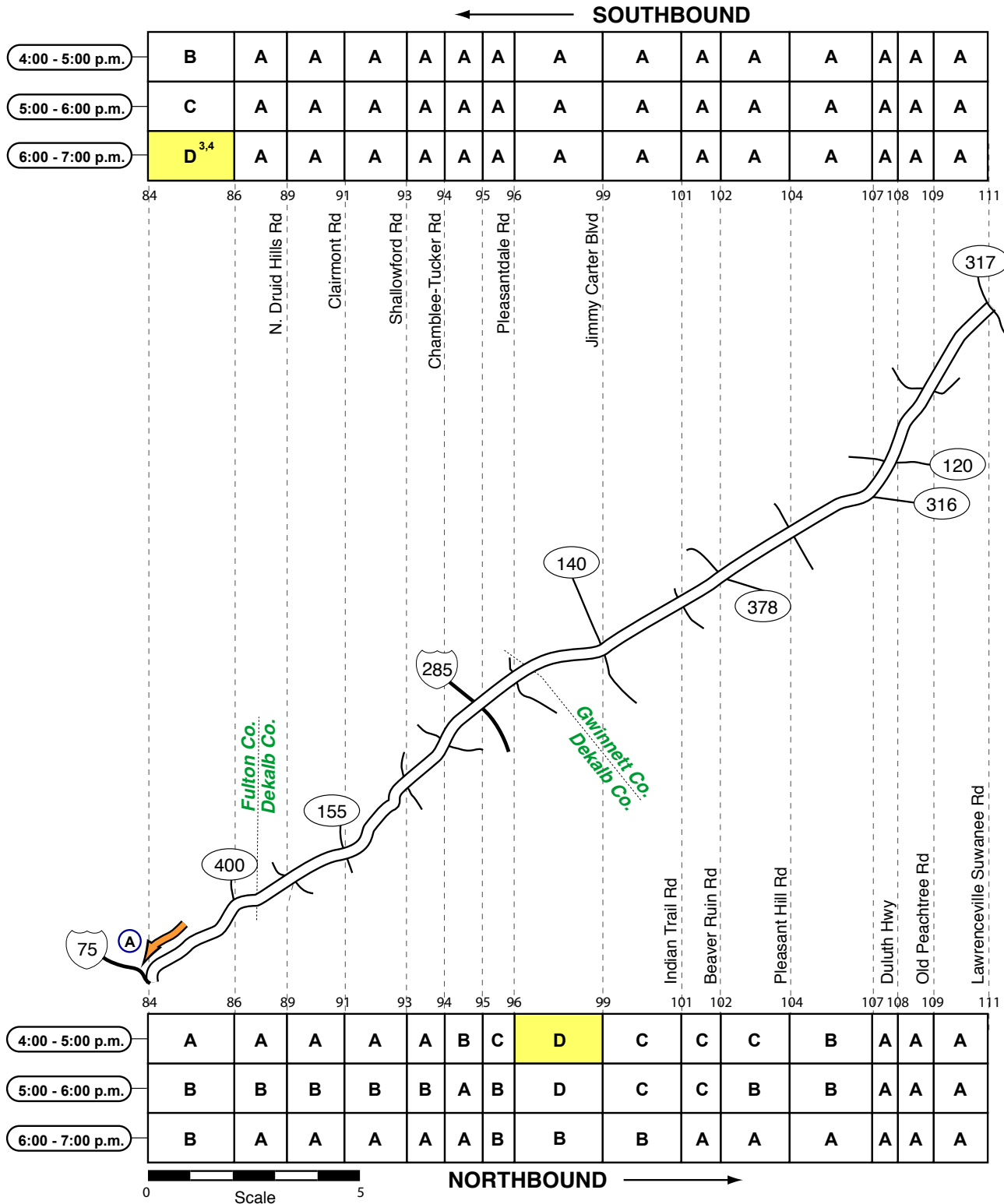


Superscripts: ¹ Type 1 nested congestion (some days, not others).

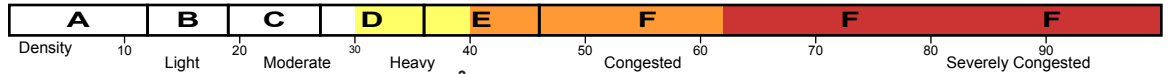
² Type 2 nested congestion (more severe in left or right-hand lanes).

³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).

I-85 HOV (Fulton/Dekalb & Gwinnett Counties) - Evening

Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-85 HOV (Fulton/Dekalb & Gwinnett Counties) - Evening

A

Congestion Type: HOV Congestion

Frequency: Intermittently after 6:00 p.m.

Direction: Southbound

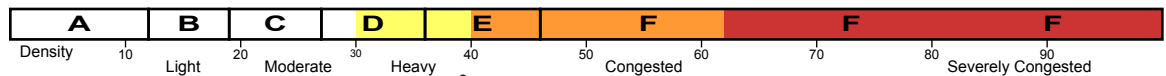
Location: Between SR 400 and the I-75/I-85 merge

Queue Length: 1 to 2 miles

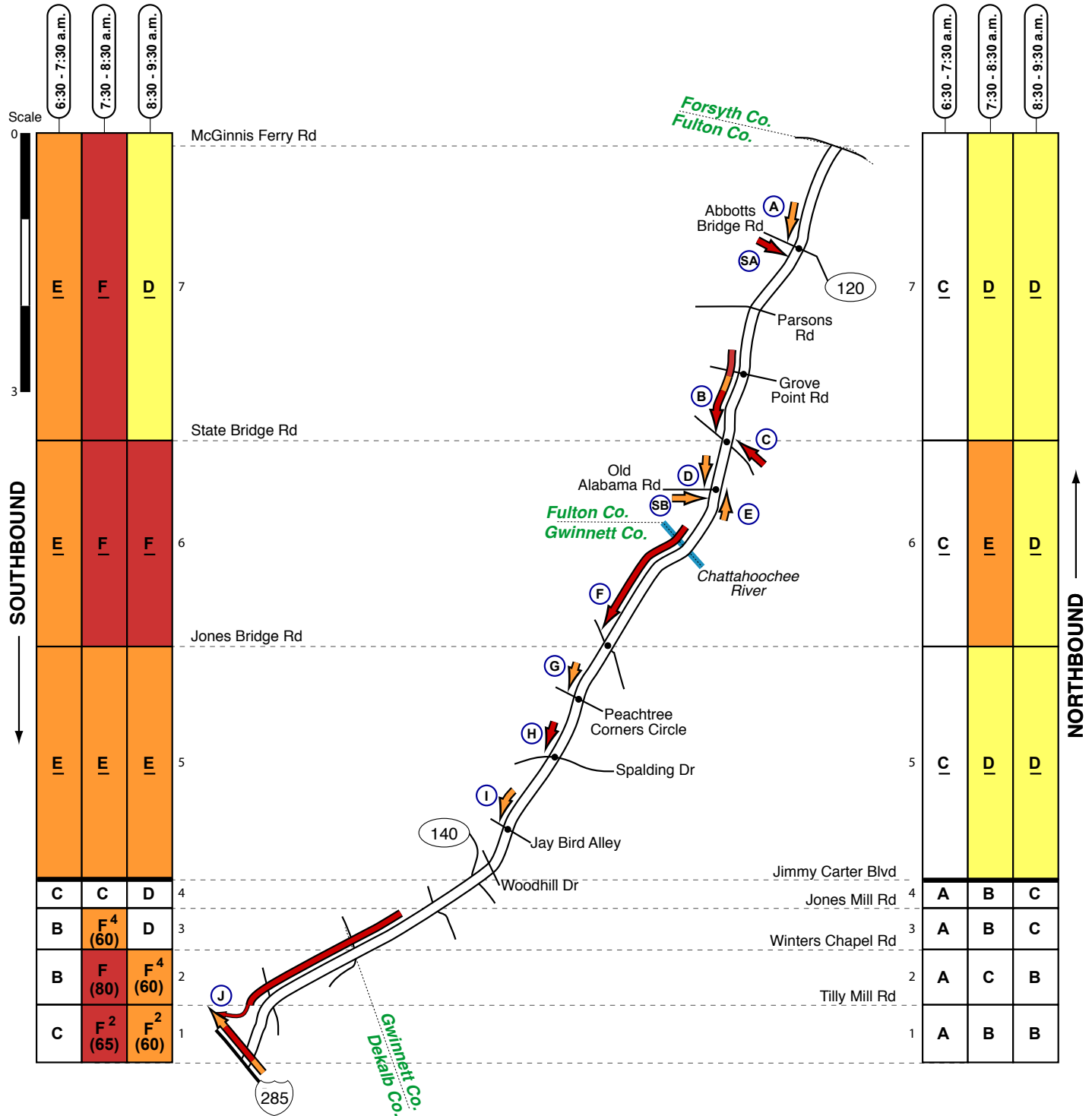
Estimated Speed: 30 to 50 mph

Potential Cause(s): Friction between the congested 'general-purpose' lanes and the HOV facility

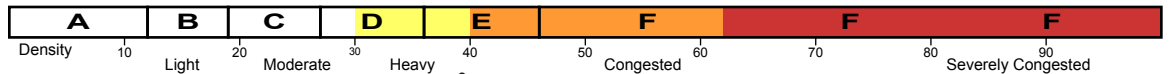
Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

SR 141 (Fulton/Gwinnett & Dekalb Counties) - Morning



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

SR 141 (Fulton/Gwinnett & Dekalb Counties) - Morning

A

Congestion Type: Mainline Signal Queue
 Location: SR 120
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2
 Note: During some observations, southbound congestion approaching SR 120 was limited to the the left lane.

B

Congestion Type: Mainline Signal Queue
 Location: State Bridge Rd
 Frequency: Most Observations
 Direction: Southbound
 Queue Population: 20 to 120 vpl
 Number of Lanes: 2
 Note: During some observations, southbound congestion approaching the signal at State Bridge Rd extended back through the upstream signal at Grove Point Rd.

C

Congestion Type: Cross Road Signal Queue
 Location: State Bridge Rd
 Frequency: Peak Hour
 Direction: Northbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

D

Congestion Type: Mainline Signal Queue
 Location: Old Alabama Rd
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 2

E

Congestion Type: Mainline Signal Queue
 Location: Old Alabama Rd
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 35 vpl
 Number of Lanes: 2

F

Congestion Type: Mainline Signal Queue
 Location: Jones Bridge Rd
 Frequency: Most Observations
 Direction: Southbound
 Number of Lanes: 2
 Note: During the peak period, southbound congestion approaching the signal at Jones Bridge Rd typically extended back across the Chattahoochee River to the vicinity of the Atlanta Athletic Club (a distance of approximately two miles).

G

Congestion Type: Mainline Signal Queue
 Location: Peachtree Corners Circle
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

H

Congestion Type: Mainline Signal Queue
 Location: Spalding Dr
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

I

Congestion Type: Mainline Signal Queue
 Location: Jay Bird Alley
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 2

J

Congestion Type: Mainline Congestion
 Frequency: Most observations after 7:30 a.m.
 Direction: Southbound
 Location: Between Jones Mill Rd and I-285
 Queue Length: 2 to 3 miles
 Estimated Speed: 20 to 40 mph
 Potential Cause(s): The head of the queue was found on the ramp to I-285; congestion typically extended back into the right lane (and eventually across all lanes) of SR 141.

SA

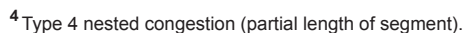
Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 120
 Frequency: Peak Hour
 Direction: Eastbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 1

SB

Congestion Type: Surveyed Cross Road Signal Queue
 Location: Old Alabama Rd
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 2
 Note: When congested, vehicles were queued in the two left-turn lanes at SR 141 (terminus of Old Alabama Rd).

Traffic Quality Rating

A	B	C	D	E	F
Very Light	Light	Moderate	Heavy	Congested	Severe



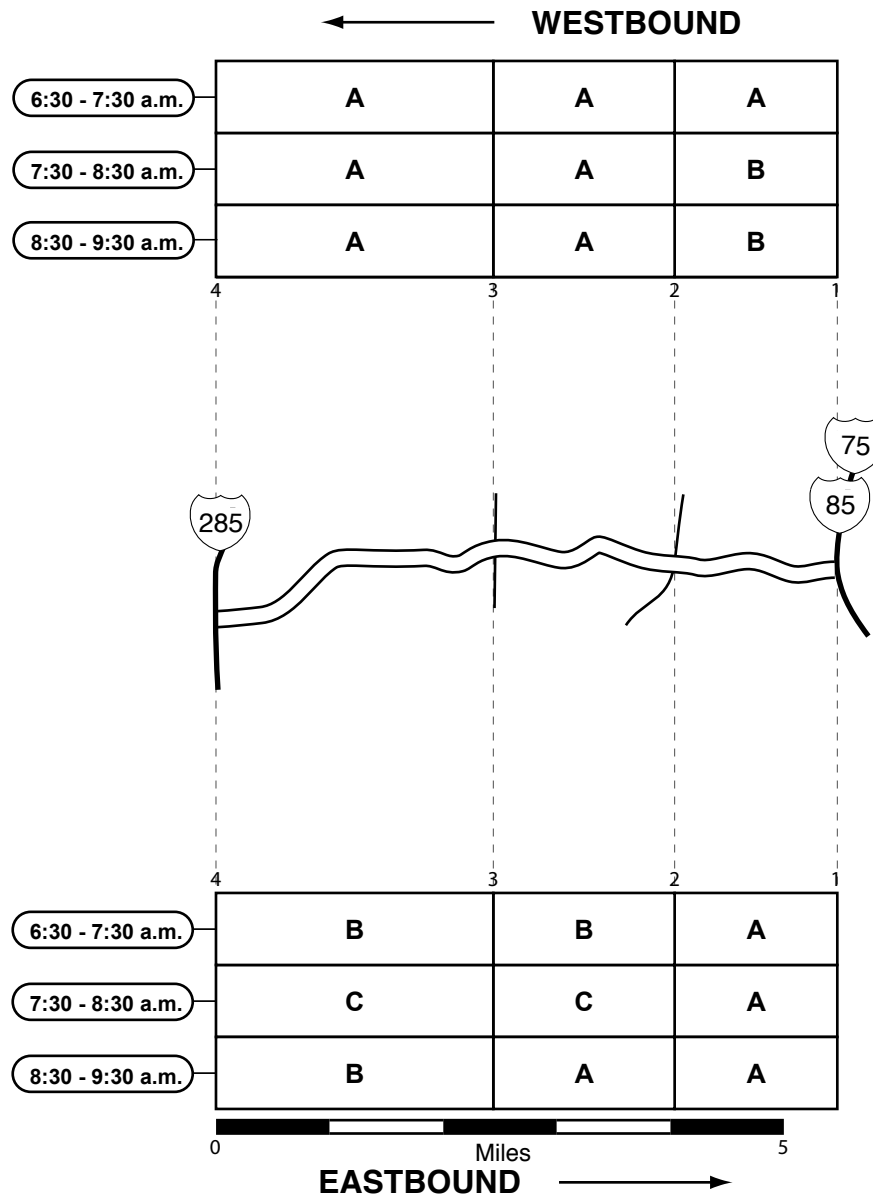
SR 141 (Fulton/Gwinnett & Dekalb Counties) - Evening

A Congestion Type: Cross Road Signal Queue Location: McGinnis Ferry Rd Frequency: Intermittent Direction: Westbound Queue Population: 20 to 40 vpl Number of Lanes: 1	G Congestion Type: Cross Road Signal Queue Location: State Bridge Rd Frequency: Most Observations Direction: Southbound Queue Population: 20 to 50 vpl Number of Lanes: 2	L Congestion Type: Mainline Signal Queue Location: Jones Bridge Rd Frequency: Most Observations Direction: Northbound Queue Population: 20 to 40 vpl Number of Lanes: 2	S Congestion Type: Mainline Signal Queue Location: Holcomb Bridge Rd Frequency: Intermittent Direction: Northbound Queue Population: 20 to 25 vpl Number of Lanes: 2
B Congestion Type: Mainline Signal Queue Location: Johns Creek Pkwy Frequency: Intermittent Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2	H Congestion Type: Mainline Signal Queue Location: State Bridge Rd Frequency: Intermittent Direction: Northbound Queue Population: 20 to 40 vpl Number of Lanes: 2 Note: During some observations, northbound congestion approaching State Bridge Rd extended back through the upstream signal at Medlock Crossing Pkwy.	M Congestion Type: Mainline Signal Queue Location: Peachtree Corners Circle Frequency: Peak Hour Direction: Northbound Queue Population: 20 to 60 vpl Number of Lanes: 2	T Congestion Type: Left-Turn Queue Location: I-285 Frequency: Peak Hour Direction: Southbound Queue Population: 30 to 50 vpl Number of Lanes: 2
C Congestion Type: Mainline Signal Queue Location: SR 120 Frequency: Most Observations Direction: Southbound Queue Population: 20 to 40 vpl Number of Lanes: 2 Note: During some observations, southbound congestion at SR 120 was limited to the left turn bay at the signal.	I Congestion Type: Mainline Signal Queue Location: Medlock Crossing Pkwy Frequency: Intermittent Direction: Northbound Queue Population: 20 to 40 vpl Number of Lanes: 2 Note: During some observations, northbound congestion approaching Medlock Crossing Pkwy extended back through the upstream signal at Old Alabama Rd.	N Congestion Type: Mainline Signal Queue Location: Spalding Dr Frequency: Intermittent Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2	SA Congestion Type: Surveyed Cross Road Signal Queue Location: Abbotts Bridge Rd Frequency: Most Observations Direction: Eastbound Queue Population: 20 to 60 vpl Number of Lanes: 1
D Congestion Type: Mainline Signal Queue Location: SR 120 (Abbotts Bridge Rd) Frequency: Intermittent Direction: Northbound Queue Population: 20 to 30 vpl Number of Lanes: 2	J Congestion Type: Mainline Signal Queue Location: Old Alabama Rd Frequency: Most Observations Direction: Northbound Number of Lanes: 2 Note: During the peak period, congestion typically extended back across the Chattahoochee River; on two of the mornings surveyed, congestion extended all the way back to Jones Bridge Rd (a distance of approximately 2 miles).	O Congestion Type: Mainline Signal Queue Location: Spalding Dr Frequency: Most Observations Direction: Northbound Queue Population: 20 to 60 vpl Number of Lanes: 2	SB Congestion Type: Surveyed Cross Road Signal Queue Location: Abbotts Bridge Rd Frequency: Intermittent Direction: Westbound Queue Population: 20 to 25 vpl Number of Lanes: 1
E Congestion Type: Mainline Signal Queue Location: State Bridge Rd Frequency: Most Observations Direction: Southbound Queue Population: 20 to 40 vpl Number of Lanes: 2 Note: During some observations, southbound congestion approaching State Bridge Rd was limited to the left turn bay (and the left lane on SR 141).	K Congestion Type: Platoons Location: Between State Bridge Rd & Jones Bridge Rd Frequency: Intermittent Direction: Southbound Queue Population: 25 to 35 vpl Number of Lanes: 2	P Congestion Type: Cross Road Signal Queue Location: Spalding Dr Frequency: Intermittent Direction: Eastbound Queue Population: 20 to 40 vpl Number of Lanes: 1	SC Congestion Type: Surveyed Cross Road Signal Queue Location: Old Alabama Rd Frequency: Most Observations Direction: Eastbound Queue Population: 20 to 55 vpl Number of Lanes: 2 Note: When congested, vehicles were queued in the two dedicated left-turn lanes at SR 141; vehicles turning right (southbound) on SR 141 appeared to bypass the queue without delay.
F Congestion Type: Cross Road Signal Queue Location: State Bridge Rd Frequency: Intermittent Direction: Northbound Queue Population: 20 to 30 vpl Number of Lanes: 2	R Congestion Type: Mainline Signal Queue Location: Holcomb Bridge Rd Frequency: Intermittent Direction: Southbound Queue Population: 20 to 30 vpl Number of Lanes: 2	Q Congestion Type: Mainline Signal Queue Location: Jay Bird Alley Frequency: Intermittent Direction: Southbound Queue Population: 20 to 25 vpl Number of Lanes: 2	

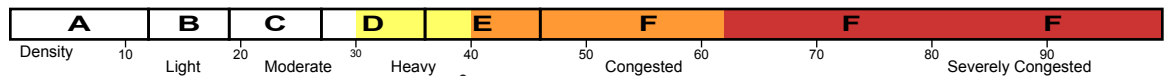
Traffic Quality Rating

A	B	C	D	E	F
Very Light	Light	Moderate	Heavy	Congested	Severe

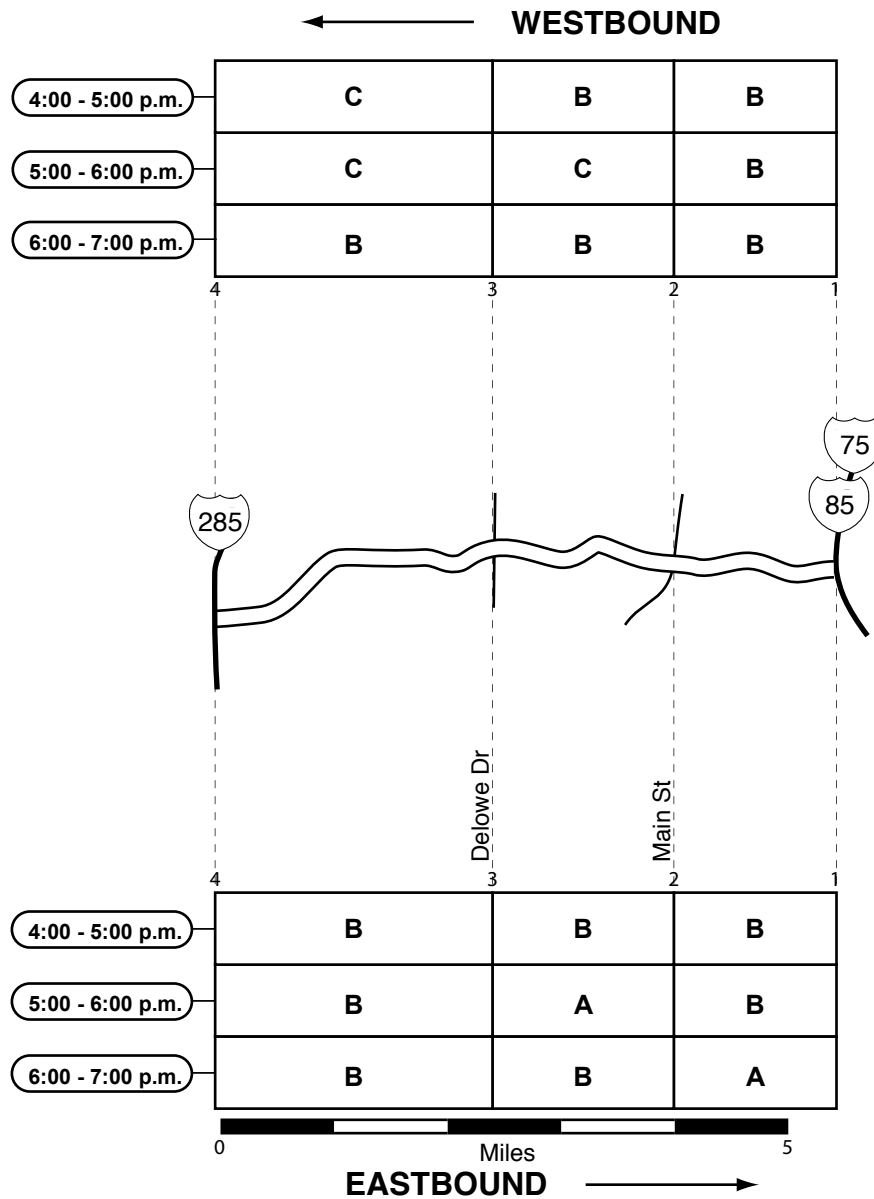
SR 166 (Fulton County) - Morning



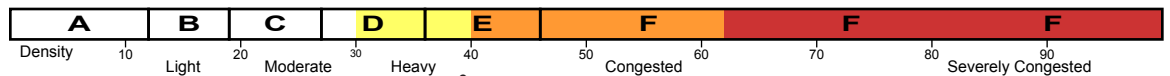
Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

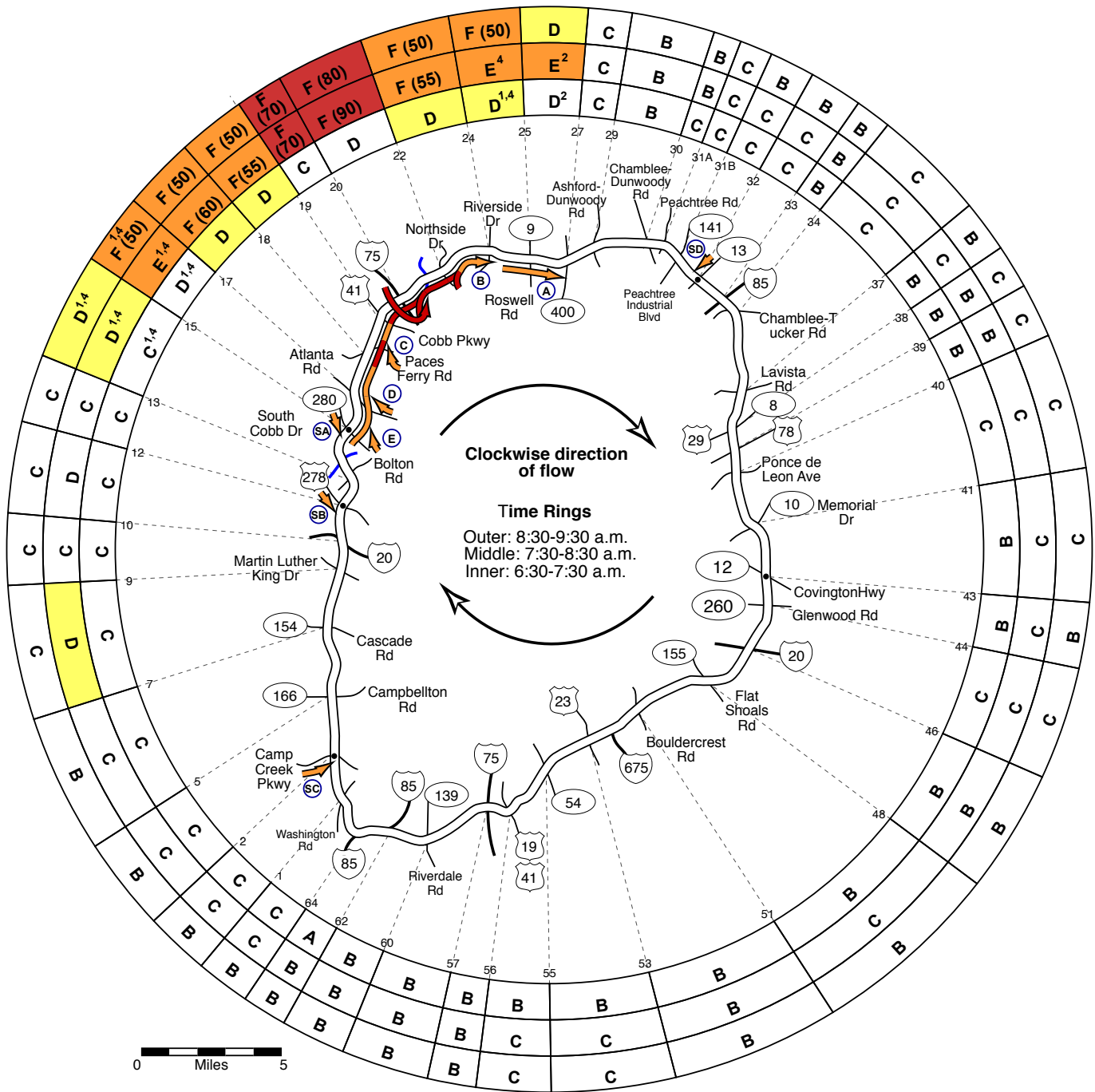
SR 166 (Fulton County) - Evening



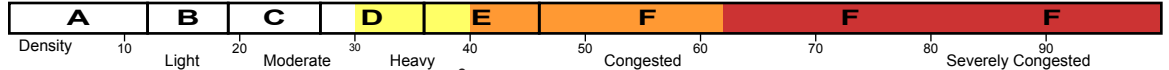
Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

The Perimeter (I-285 Clockwise) - Morning



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

The Perimeter (I-285 Clockwise) - Morning

A

Congestion Type: Mainline Congestion
Frequency: Peak Hour
Direction: Eastbound
Location: Between Riverside Dr and SR 400
Queue Length: 2 to 3 miles
Estimated Speed: 25 to 50 mph
Potential Cause(s): The head of the queue was found on the ramp to SR 400; congestion typically extended back into the right two lanes of the Perimeter (thru-traffic in the left lanes of the Perimeter appeared to bypass the queue with little or no delay). Congestion was exacerbated by sun glare.

B

Congestion Type: Mainline Congestion
Frequency: Most observations after 7:30 a.m.
Direction: Northeast-bound
Location: Between US 278 and Riverside Dr
Queue Length: 7 to 11 miles
Estimated Speed: 15 to 45 mph
Potential Cause(s): The primary cause of congestion appeared to be traffic entering the mainline at the interchanges along this section of I-285; the primary bottleneck was found at the closely spaced ramps where traffic entered I-285 from I-75 and the service road originating at SR 3 (Cobb Pkwy). It appeared that congestion was exacerbated by sun glare.

C

Congestion Type: Entrance Ramp Queue
Frequency: Intermittent
Direction: Northbound
Location: Paces Ferry Rd
Queue Population: 25 to 35 vpl
Number of Lanes: 2
Note: The head of the queue was found at the ramp meter; on two of four days, congestion extended back into the right lane of Paces Ferry Rd (westbound).

D

Congestion Type: Entrance Ramp Queue
Location: Atlanta Rd
Frequency: Intermittent
Direction: Northbound
Queue Population: 20 to 30 vpl
Number of Lanes: 1
Note: When congested, the head of the queue was found at the ramp meter. During one observation only, congestion extended back into the approach lanes on Atlanta Rd.

E

Congestion Type: Entrance Ramp Queue
Location: SR 280 (S. Cobb Dr)
Frequency: Intermittent
Direction: Northbound
Queue Population: 20 to 30 vpl
Number of Lanes: 1
Note: The head of the queue was found where vehicles merged into congested northbound flow on I-285; congestion was exacerbated by the lane drop (2 lanes to 1) on the ramp.

SA

Congestion Type: Surveyed Cross Road Signal Queue
Location: SR 280
Frequency: Intermittent
Direction: Southbound
Queue Population: 20 to 30 vpl
Number of Lanes: 2
Note: When congested, vehicles were queued in the two left-turn lanes at the signal waiting to turn onto the I-285 northbound ramp.

SB

Congestion Type: Surveyed Cross Road Signal Queue
Location: US 278
Frequency: Peak Hour
Direction: Eastbound
Queue Population: 20 to 30 vpl
Number of Lanes: 2
Note: Eastbound congestion at I-85 typically extended back through the closely spaced upstream signal at Bolton Rd.

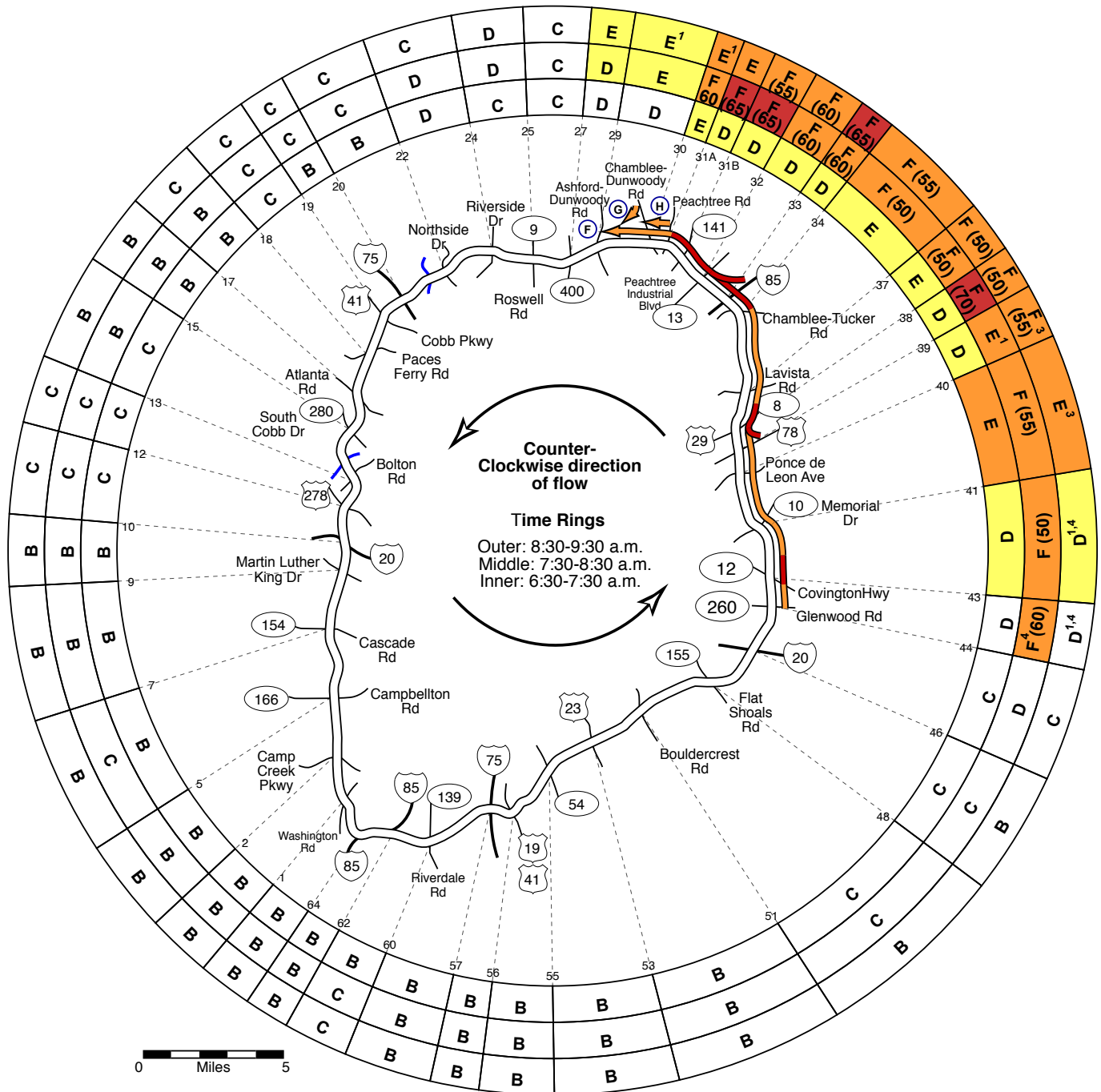
SC

Congestion Type: Surveyed Cross Road Signal Queue
Location: Camp Creek Pkwy
Frequency: Intermittent
Direction: Southbound
Queue Population: 20 to 30 vpl
Number of Lanes: 2

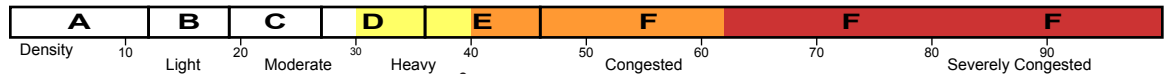
SD

Congestion Type: Surveyed Cross Road Signal Queue
Location: SR 13
Frequency: Intermittent
Direction: Southbound
Queue Population: 20 to 30 vpl
Number of Lanes: 1
Note: Intermittently, congestion in the left-turn lane extended back into the mainline of SR 13.

The Perimeter (I-285 Counter-Clockwise) - Morning



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

The Perimeter (I-285 Counter-Clockwise) - Morning

F

Congestion Type: Mainline Congestion

Frequency: Most observations after 7:30 a.m.

Direction: Northwest-bound

Location: Between SR 260 (Glenwood Rd) and Ashford-Dunwoody Rd

Queue Length: 10 to 15 miles

Estimated Speed: 20 to 50 mph

Potential Cause(s): Congestion appeared to be exacerbated by merging and weaving at the interchanges along this section of I-285, particularly at US 78, I-85 and SR 141.

G

Congestion Type: Entrance Ramp Queue

Location: Chamblee-Dunwoody Rd

Frequency: Intermittent

Direction: Westbound

Queue Population: 20 to 25 vpl

Number of Lanes: 1

Note: The head of the queue was found at the ramp meter.

H

Congestion Type: Frontage Road Queue

Location: Chamblee-Dunwoody Rd

Frequency: Intermittent

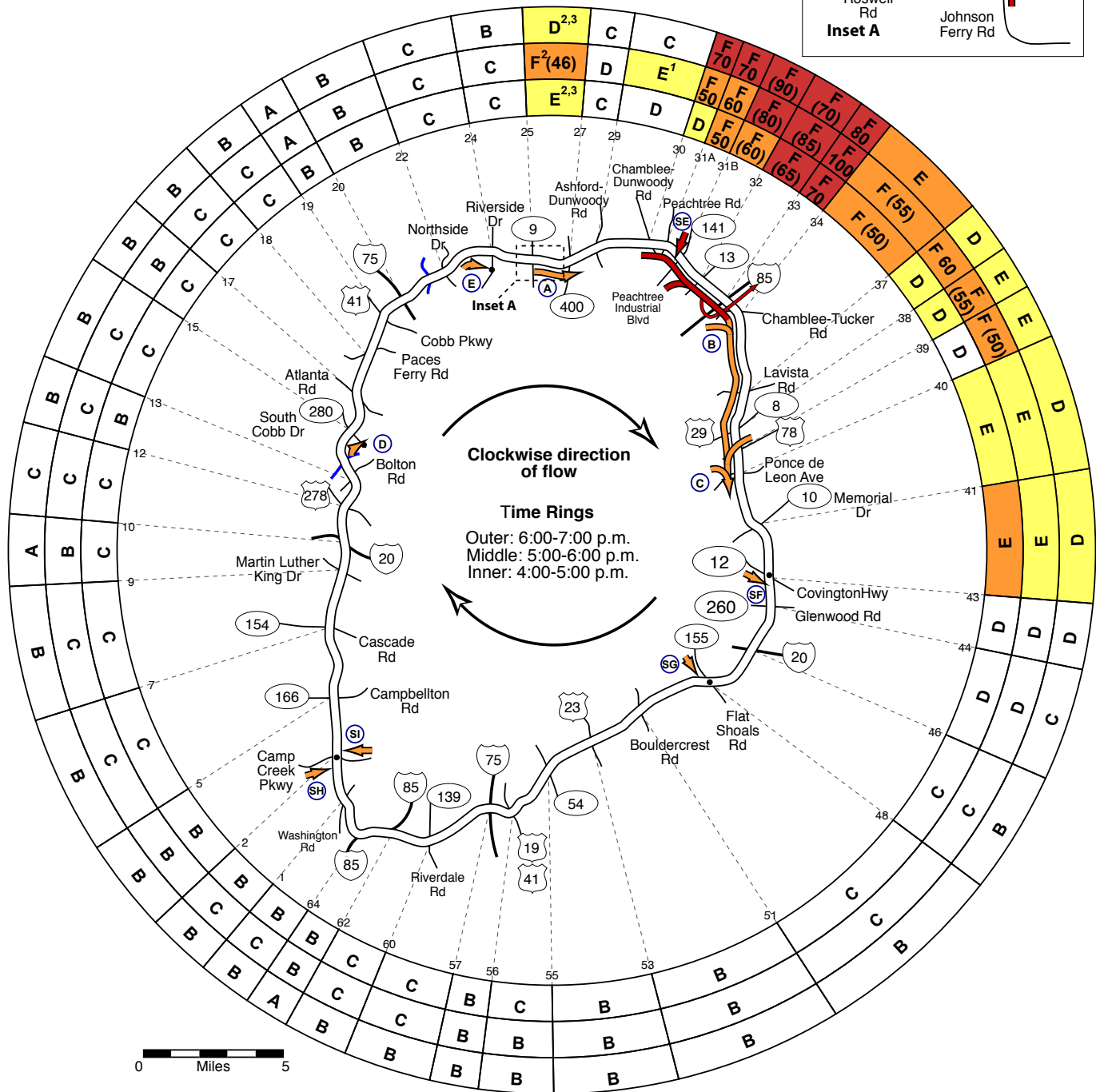
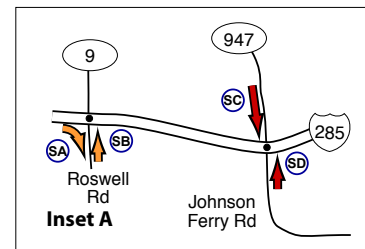
Direction: Westbound

Queue Population: 30 to 40 vpl

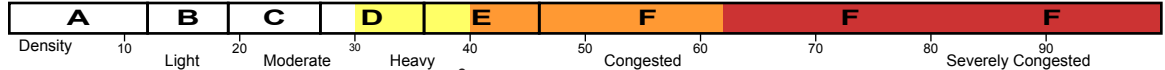
Number of Lanes: 1

Note: When congested, vehicles were queued in the one thru-lane at the signal (to the westbound I-285 entrance ramp).

The Perimeter (I-285 Clockwise) - Evening



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

The Perimeter (I-285 Clockwise) - Evening

A

Congestion Type: Mainline Congestion
 Frequency: Most observations between 4:30 and 6:30 p.m.
 Direction: Eastbound
 Location: Between Roswell Rd and SR 400
 Queue Length: 0.5 to 1.5 miles
 Estimated Speed: 20 to 50 mph
 Potential Cause(s): The head of the queue was found on the ramp to SR 400; congestion typically extended back into the right two lanes of the Perimeter (thru-traffic in the left lanes of the Perimeter appeared to bypass the queue with little or no delay).

B

Congestion Type: Entrance Ramp Queue
 Location: Chamblee-Tucker Rd
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1
 Note: The head of the queue was found at the ramp meter.

C

Congestion Type: Mainline Congestion
 Frequency: Most Observations
 Direction: South-eastbound
 Location: Between Chamblee-Dunwoody Rd and SR 10 (Memorial Dr)
 Queue Length: 9 to 13 miles
 Estimated Speed: 10 to 45 mph
 Potential Cause(s): Factors contributing to the congestion were: 1) congestion in the exit lanes at I-85 extending back into the mainline of the Perimeter and; 2) traffic entering at the SR 141, I-85 and US 78 interchanges.

D

Congestion Type: Exit Ramp Queue
 Location: SR 280
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2
 Note: The head of the queue was found in the two left-turn lanes at the signal at the end of the ramp.

E

Congestion Type: Exit Ramp Queue
 Location: Riverside Dr
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 1

SA

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: SR 9 (Roswell Rd)
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

SB

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: SR 9 (Roswell Rd)
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

SC

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: Johnson Ferry Rd
 Frequency: Most Observations
 Direction: Southbound
 Queue Population: 20 to 60 vpl
 Number of Lanes: 2
 Note: During most observations, congestion was more severe in the right lane approaching the I-285 Interchange; vehicles in the right lane could access the ramp to westbound I-285.

SD

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: Johnson Ferry Rd
 Frequency: Most Observations
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1
 Note: When congested, vehicles were queued in the dedicated left- turn lane waiting to turn onto the I-285 westbound entrance ramp.

SE

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: SR 141
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 30 to 50 vpl
 Number of Lanes: 2

SF

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: SR 12
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 2

SG

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: SR 155 (Flat Shoals Rd)
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: Two

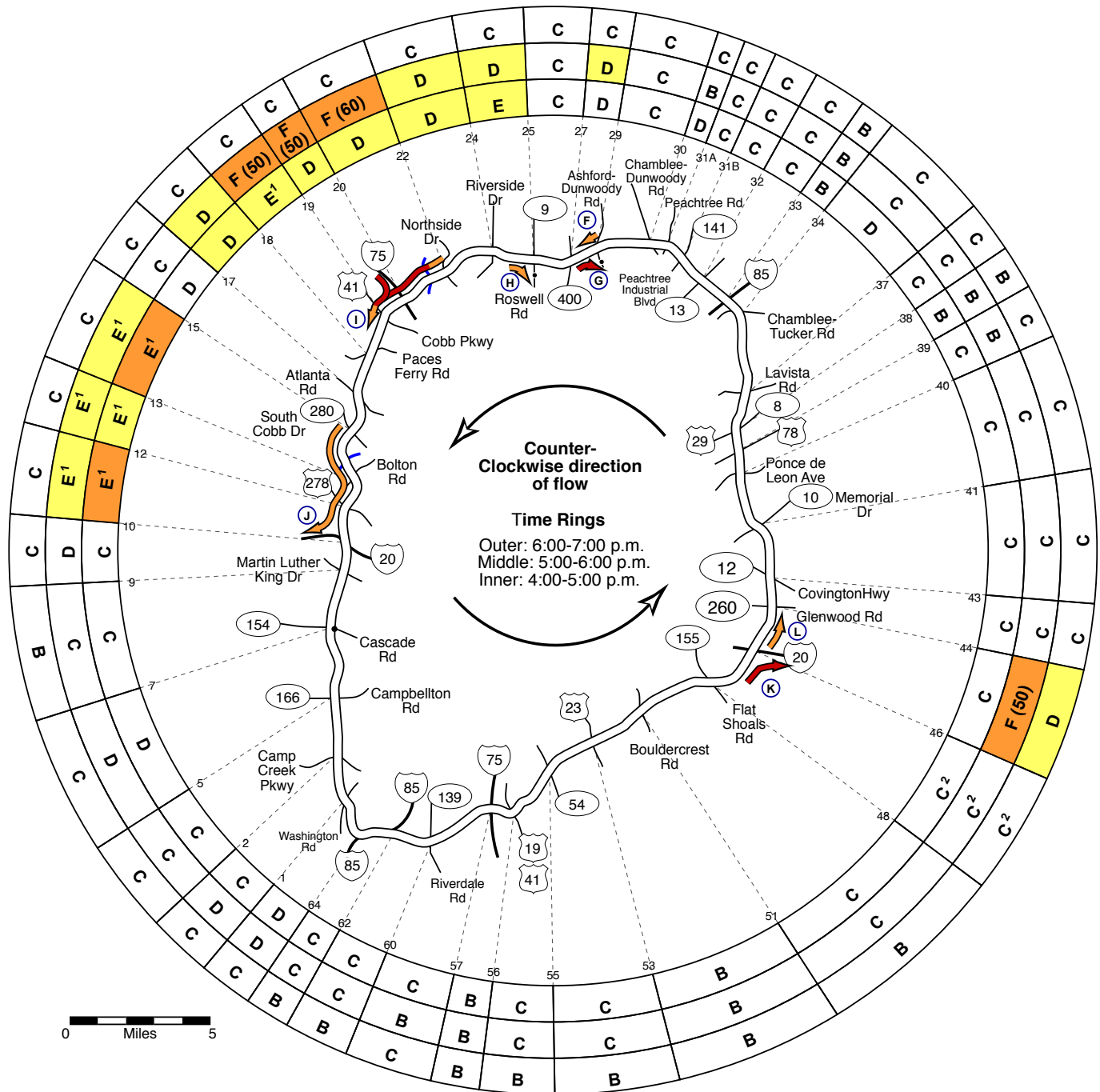
SH

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: Camp Creek Pkwy
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2
 Note: When congested, vehicles were queued in the left lane on SR 6 approaching the signal at the I-285 northbound entrance ramp; congestion typically extended back through the upstream signal at the I-285 southbound ramps.

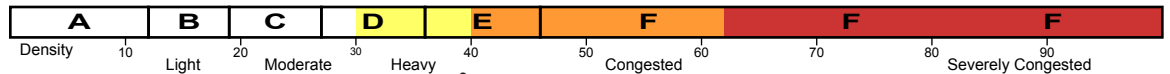
SI

Congestion Type: Surveyed Cross Road
 Signal Queue
 Location: Camp Creek Pkwy
 Frequency: Intermittent
 Direction: Westbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

The Perimeter (I-285 Counter-Clockwise) - Evening



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

The Perimeter (I-285 Counter-Clockwise) - Evening

F

Congestion Type: Mainline Congestion
Frequency: Peak Hour
Direction: Westbound
Location: Between Ashford-Dunwoody Rd and SR 400
Queue Length: 0.5 to 1 miles
Estimated Speed: 20 to 50 mph
Potential Cause(s): The head of the queue was found on the ramp to SR 400; congestion typically extended back into the right lane of the Perimeter (thru- traffic in the left lanes of the Perimeter appeared to bypass the queue with little or no delay). On some days but not others, congestion extended back onto the entrance ramp from Ashford-Dunwoody Dr.

G

Congestion Type: Exit Ramp Queue
Location: Ashford-Dunwoody Rd
Frequency: Most observations after 6:00 p.m.
Direction: Eastbound
Queue Population: 20 to 50 vpl
Number of Lanes: 2
Note: Congestion extended back into the right lane of the perimeter (thru-traffic on the Perimeter was able to bypass the queue without delay).

H

Congestion Type: Exit Ramp Queue
Location: SR 9 (Roswell Rd)
Frequency: Intermittent
Direction: Eastbound
Queue Population: 20 to 40 vpl
Number of Lanes: 2

I

Congestion Type: Mainline Congestion
Frequency: Peak Hour
Direction: South-westbound
Location: Between Northside Dr and Paces Ferry Rd
Queue Length: 3 to 4 miles
Estimated Speed: 25 to 50 mph
Potential Cause(s): Factors contributing to the congestion were: 1) merging associated with the I-75 interchange and; 2) the series of lane drops (6 lanes to 2) approaching the I-75 interchange.

J

Congestion Type: Mainline Congestion
Frequency: Intermittent
Direction: Southbound
Location: Between SR 280 and I-20
Queue Length: 3 to 5 miles
Estimated Speed: 25 to 50 mph
Potential Cause(s): Intermittently, the head of the queue was found on the ramp to I-20; congestion extended back into the right lane (and eventually across all lanes) of the Perimeter. Factors contributing to the congestion were: 1) the geometrics of the road (sharp bends) along this corridor and; 2) the bridge over the Chattahoochee River.

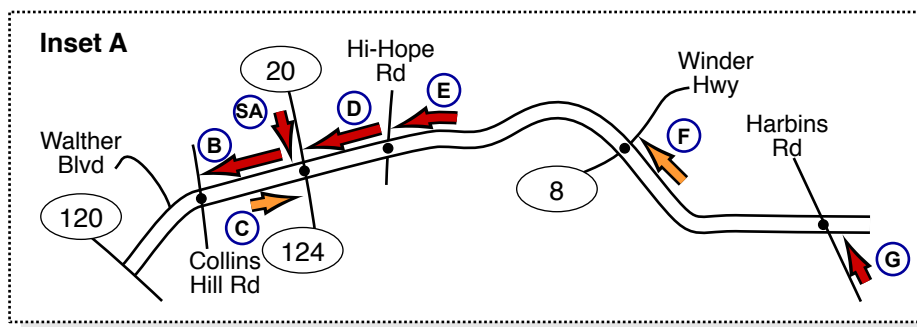
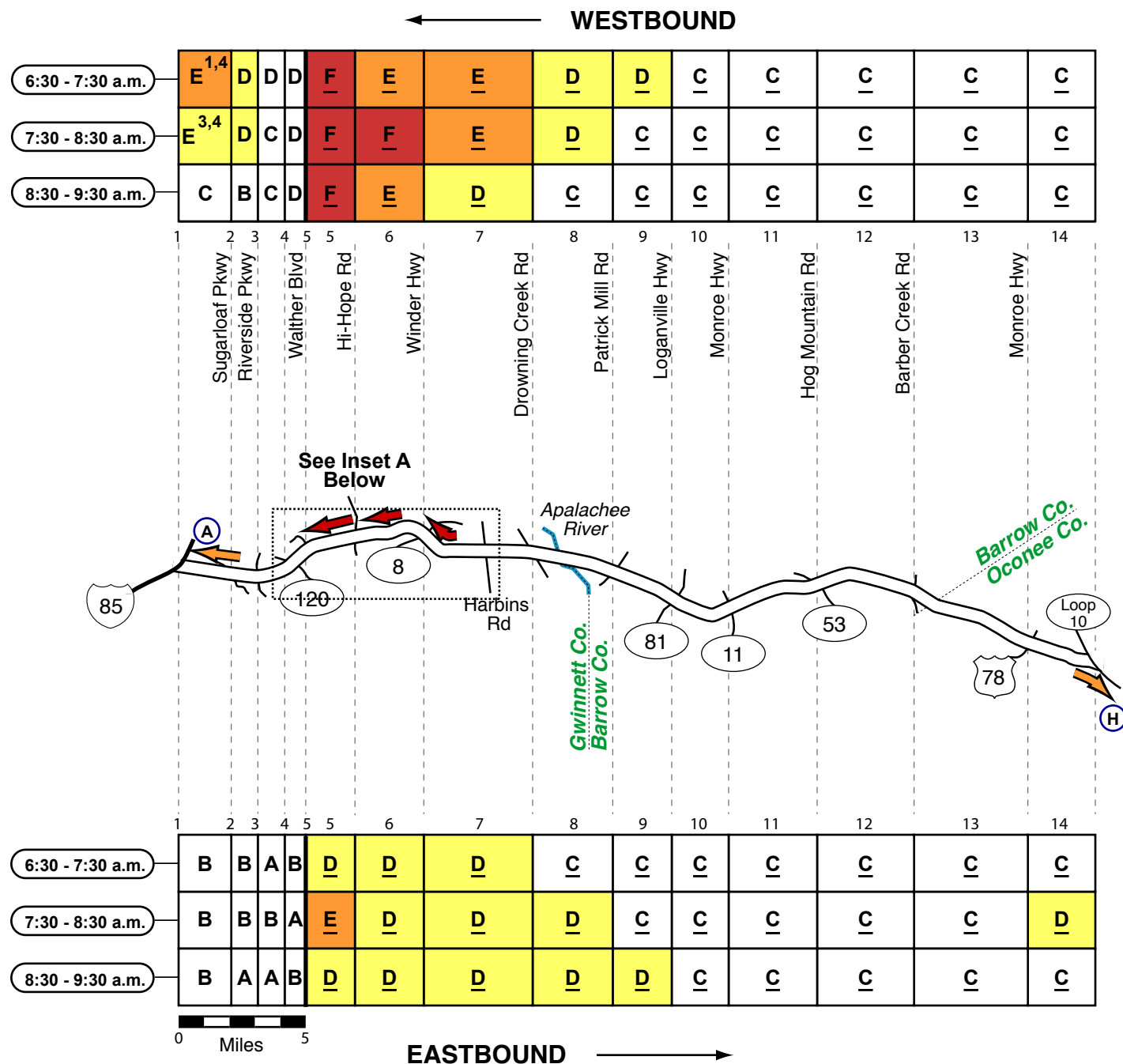
K

Congestion Type: Mainline Congestion
Frequency: Most Observations
Direction: North-eastbound
Location: Between Flat Shoals Rd and I-20
Queue Length: 0.5 to 1 miles
Estimated Speed: 10 to 30 mph
Potential Cause(s): Congestion on the ramp to eastbound I-20 typically extended back into the right lane on I-285. The head of the queue on the one lane ramp was found where vehicles merged with ramp traffic from I-285 southbound.

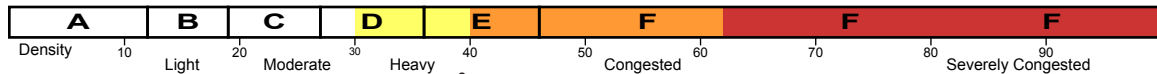
L

Congestion Type: Mainline Congestion
Frequency: On some days but not others
Direction: Northbound
Location: Between I-20 and Glenwood Rd
Queue Length: 1 to 2 miles
Estimated Speed: 25 to 50 mph
Potential Cause(s): Congestion appeared to be caused or exacerbated by the lane drop (5 lanes to 4) where traffic entered from I-20.

SR 316 (Gwinnett/Barrow & Oconee Counties) - Morning



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

SR 316 (Gwinnett/Barrow & Oconee Counties) - Morning

A

Congestion Type: Mainline Congestion
 Frequency: Most observations before 8:00 a.m.
 Direction: Westbound
 Location: Between Riverside Pkwy and I-85
 Queue Length: 2.5 to 3.5 miles
 Estimated Speed: 40 to 50 mph
 Potential Cause(s): Factors contributing to the congestion were:
 1) traffic entering at Riverside Pkwy and Sugarloaf Parkway and;
 2) the weaving associated with the HOV lane ramp at the I-85 interchange. On some days but not others, congestion was found on the mainline ramp to I-85.

B

Congestion Type: Mainline Signal Queue
 Location: Collins Hill Rd
 Frequency: Most Observations
 Direction: Westbound
 Queue Population: 20 to 65 vpl
 Number of Lanes: 2

C

Congestion Type: Mainline Signal Queue/Platoons
 Location: SR 20/SR 124
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

D

Congestion Type: Mainline Signal Queue
 Location: SR 20/SR 124
 Frequency: Most Observations
 Direction: Westbound
 Queue Population: 20 to 70 vpl
 Number of Lanes: 2

E

Congestion Type: Mainline Signal Queue
 Location: Hi-Hope Rd
 Frequency: Most Observations
 Direction: Westbound
 Queue Population: 20 to 70 vpl
 Number of Lanes: 2

F

Congestion Type: Mainline Signal Queue
 Location: SR 8 (Winder Hwy)
 Frequency: Intermittent
 Direction: Westbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

G

Congestion Type: Cross Road Signal Queue
 Location: Harbins Rd
 Frequency: Peak Hour
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1

H

Congestion Type: Platoons
 Location: Approaching Loop 10
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1
 Note: During some observations, eastbound congestion was found in the right lane (dedicated lane for vehicles entering the ramp to eastbound Loop 10) between Oconee Connector and SR 10.

SA

Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 20
 Frequency: Most observations after 7:00 a.m.
 Direction: Southbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2
 Note: During one observation, congestion backed through the upstream signals at Swanson Dr and SR 124.

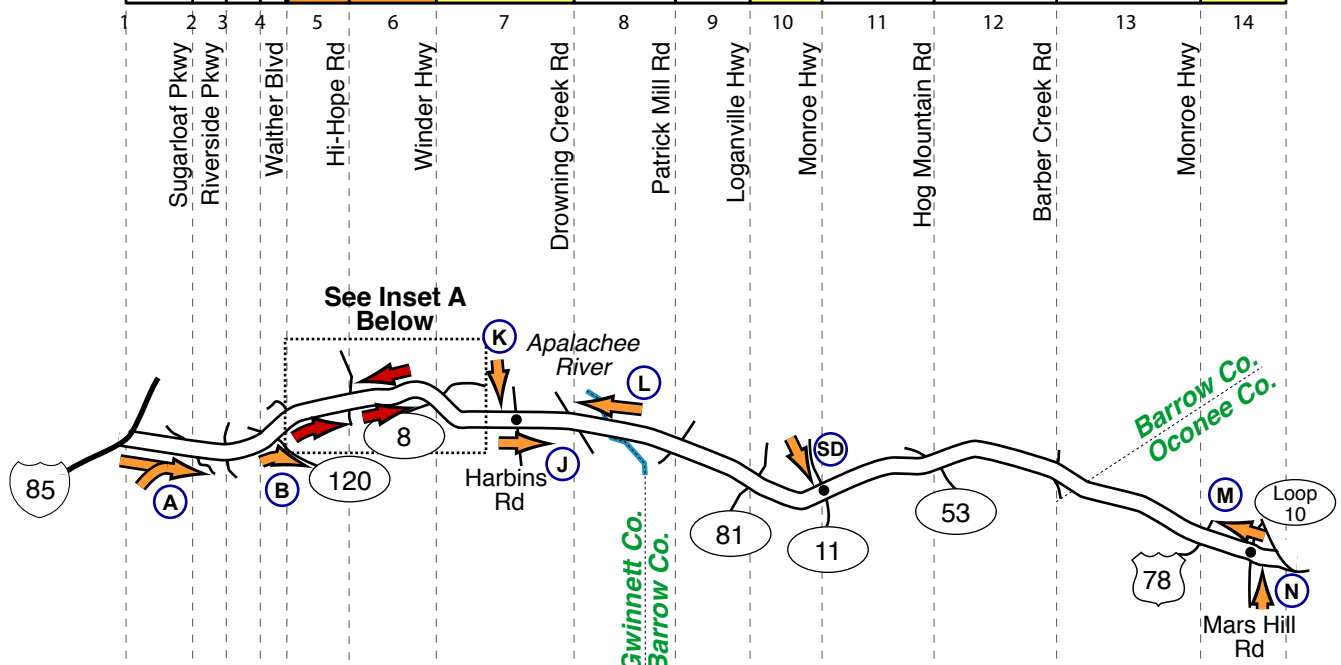
Traffic Quality Rating

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>
Very Light	Light	Moderate	Heavy	Congested	Severe

SR 316 (Gwinnett/Barrow & Oconee Counties) - Evening

← WESTBOUND

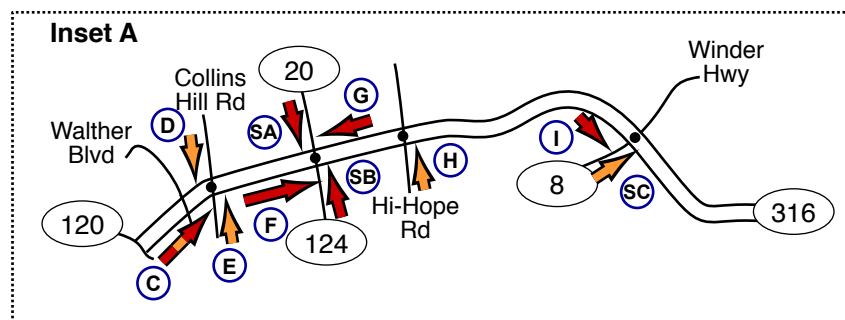
4:00 - 5:00 p.m.	C	B	A	A	F	E	D	C	C	D	C	C	C	E
5:00 - 6:00 p.m.	B	B	B	A	E	D	D	C	C	D	C	C	C	E
6:00 - 7:00 p.m.	B	B	A	B	E	E	D	C	C	D	C	C	C	D



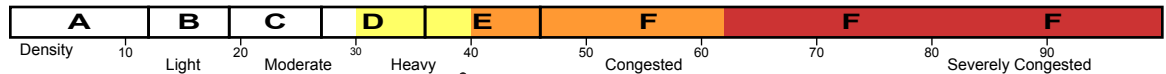
4:00 - 5:00 p.m.	E ^{1,4}	C	C	F ₅₅	F	E	E	E	D	C	C	C	C	D
5:00 - 6:00 p.m.	E ^{1,4}	C	D	F ₉₅	F	E	E	E	D	C	D	C	C	D
6:00 - 7:00 p.m.	E ^{1,4}	C	B	F ₅₅	F	E	E	D	D	C	C	C	C	C

0 Miles 5

→ EASTBOUND



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

SR 316 (Gwinnett/Barrow & Oconee Counties) - Evening

A
 Congestion Type: Mainline Congestion
 Frequency: On some days but not others
 Direction: Eastbound
 Location: Between I-85 and Sugarloaf Parkway
 Queue Length: 1 to 1.5 miles
 Estimated Speed: 30 to 50 mph
 Potential Cause(s): The primary bottleneck was found where traffic entered from Boggs Rd/I-85 Frontage Rd; while congestion persisted downstream of the merge, traffic flow typically improved.

B
 Congestion Type: Exit Ramp Queue
 Location: SR 120 (Duluth Highway)
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 25 to 50 vpl
 Number of Lanes: 1
 Note: The head of the queue was found in the right lane at the head of the ramp where traffic had to merge into congested southbound flow on SR 120.

C
 Congestion Type: Mainline Signal Queue
 Location: Collins Hill Rd
 Frequency: Most Observations
 Direction: Eastbound
 Note: During the peak period, eastbound congestion approaching the signal at Collins Hill Rd extended back to the vicinity of SR 120 (a distance of approximately 1.5 miles).

D
 Congestion Type: Cross Road Signal Queue
 Location: Collins Hill Rd
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1

E
 Congestion Type: Cross Road Signal Queue
 Location: Collins Hill Rd
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1

F
 Congestion Type: Mainline Signal Queue
 Location: SR 20/SR 124
 Frequency: Most Observations
 Direction: Eastbound
 Queue Population: 20 to 70 vpl
 Number of Lanes: 2
 Note: During some observations, congestion backed through the upstream signal at Collins Hill Rd.

G
 Congestion Type: Mainline Signal Queue
 Location: SR 20/SR 124
 Frequency: Most Observations
 Direction: Westbound
 Queue Population: 20 to 60 vpl
 Number of Lanes: 2

H
 Congestion Type: Cross Road Signal Queue
 Location: Hi-Hope Rd
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 35 vpl
 Number of Lanes: 1

I
 Congestion Type: Mainline Signal Queue
 Location: SR 8 (Winder Hwy)
 Frequency: Peak Hour
 Direction: Eastbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

J
 Congestion Type: Platoons
 Location: Between SR 8 (Winder Hwy) & Downing Creek Rd
 Frequency: Most Observations
 Direction: Eastbound
 Queue Population: 25 to 35 vpl
 Number of Lanes: 2

K
 Congestion Type: Cross Road Signal Queue
 Location: Harbins Rd
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1

L
 Congestion Type: Platoons
 Location: Between Patrick Mill Rd & Drowning Creek Rd
 Frequency: Intermittent
 Direction: Westbound
 Platoon Population: 25 to 35 vpl
 Number of Lanes: 2

M
 Congestion Type: Platoons/Mainline Signal Queue
 Location: Vicinity of Oconee Connector
 Frequency: Intermittent
 Direction: Westbound
 Platoon Population: 20 to 30 vpl
 Number of Lanes: 2

N
 Congestion Type: Cross Road Signal Queue
 Location: Mars Hill Rd (Oconee Connector)
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 1
 Note: When congested, vehicles were queued in the dedicated left turn lane at the signal.

SA
 Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 20
 Frequency: Most Observations
 Direction: Southbound
 Queue Population: 20 to 50 vpl
 Number of Lanes: 2

SB
 Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 124
 Frequency: Most Observations
 Direction: Northbound
 Queue Population: 20 to 50 vpl
 Number of Lanes: 2

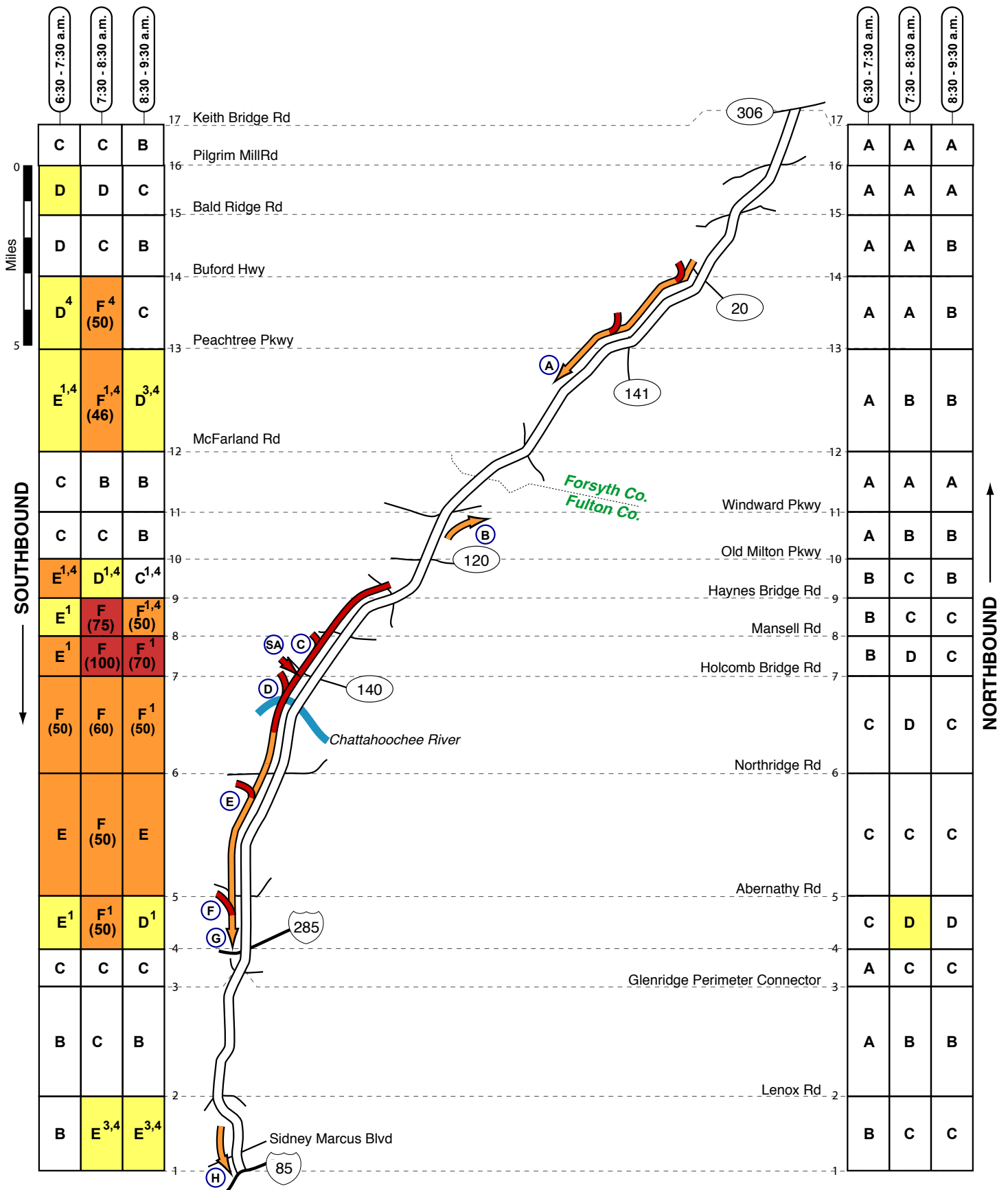
SC
 Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 8
 Frequency: Intermittent
 Direction: Eastbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 1

SD
 Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 11
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 1

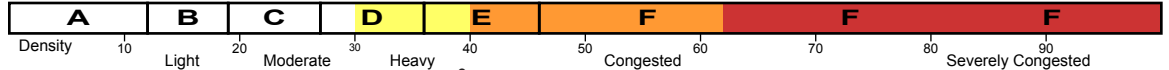
Traffic Quality Rating

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>
Very Light	Light	Moderate	Heavy	Congested	Severe

SR 400 (Forsyth & Fulton Counties) - Morning



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

SR 400 (Forsyth & Fulton Counties) - Morning

A

Congestion Type: Mainline Congestion
 Frequency: Most Observations
 Direction: Southbound
 Location: Between SR 20 and McFarland Rd
 Queue Length: 5 to 7 miles
 Estimated Speed: 30 to 50 mph
 Potential Cause(s): Traffic entering at Buford Highway and SR 141 appeared to contribute to the congestion; while congestion persisted south of SR 141, traffic flow typically improved.

B

Congestion Type: Exit Ramp Queue
 Location: Windward Parkway
 Frequency: Intermittent
 Direction: Northbound
 Note: Congestion extended back into the right lane of SR 400; the signal at the head of the ramp did not appear to be the capacity constraint.

C

Congestion Type: Entrance Ramp Queue
 Location: Mansell Rd
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 30 to 50 vpl
 Number of Lanes:
 Note: The head of the ramp queue was found where vehicles merged into the mainline on SR 400; the lane drop (2 lanes to 1) on the entrance ramp appeared to exacerbate the congestion.

D

Congestion Type: Entrance Ramp Queue
 Location: Holcomb Bridge Rd
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2
 Note: The head of the ramp queue was found where vehicles merged into the mainline on SR 400; the lane drop (4 lanes to 2) on the entrance ramp appeared to exacerbate the congestion.

E

Congestion Type: Entrance Ramp Queue
 Location: Northridge Rd
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 30 to 50 vpl
 Note: The head of the ramp queue was at the ramp meter; the lane drop (2 lanes to 1) on the entrance ramp appeared to exacerbate the congestion.

F

Congestion Type: Entrance Ramp Queue
 Location: Abernathy Rd
 Frequency: Peak Hour
 Direction: Southbound
 Queue Population: 20 to 40 vpl
 Note: The head of the ramp queue was found where vehicles merged into the mainline on SR 400.

G

Congestion Type: Mainline Congestion
 Frequency: Most observations after 7:00 a.m.
 Direction: Southbound
 Location: Between SR 120 and SR I-285
 Queue Length: 11 to 13 miles
 Estimated Speed: 20 to 50 mph
 Potential Cause(s): Congestion was exacerbated by traffic entering at the Mansell Rd, Holcomb Bridge Rd, Northridge Rd and Abernathy Rd interchanges; on some days but not others, congestion on the entrance ramps extended back onto the arterial highways. Mainline congestion was most severe between Haynes Bridge Rd and Holcomb Bridge Rd where stop-and-go flow was found during the peak hour; traffic flow typically improved south of Holcomb Bridge Rd where the roadway widens from 3 lanes to 4.

H

Congestion Type: Mainline Congestion
 Frequency: Most observations between 8:00 and 9:00 a.m.
 Direction: Southbound
 Location: Between Lenox Rd and I-85
 Queue Length: 1 to 2 miles
 Estimated Speed: 30 to 50 mph
 Potential Cause(s): The head of the queue was found at the merge into congested flow on I-85 at the SR 400 terminus.

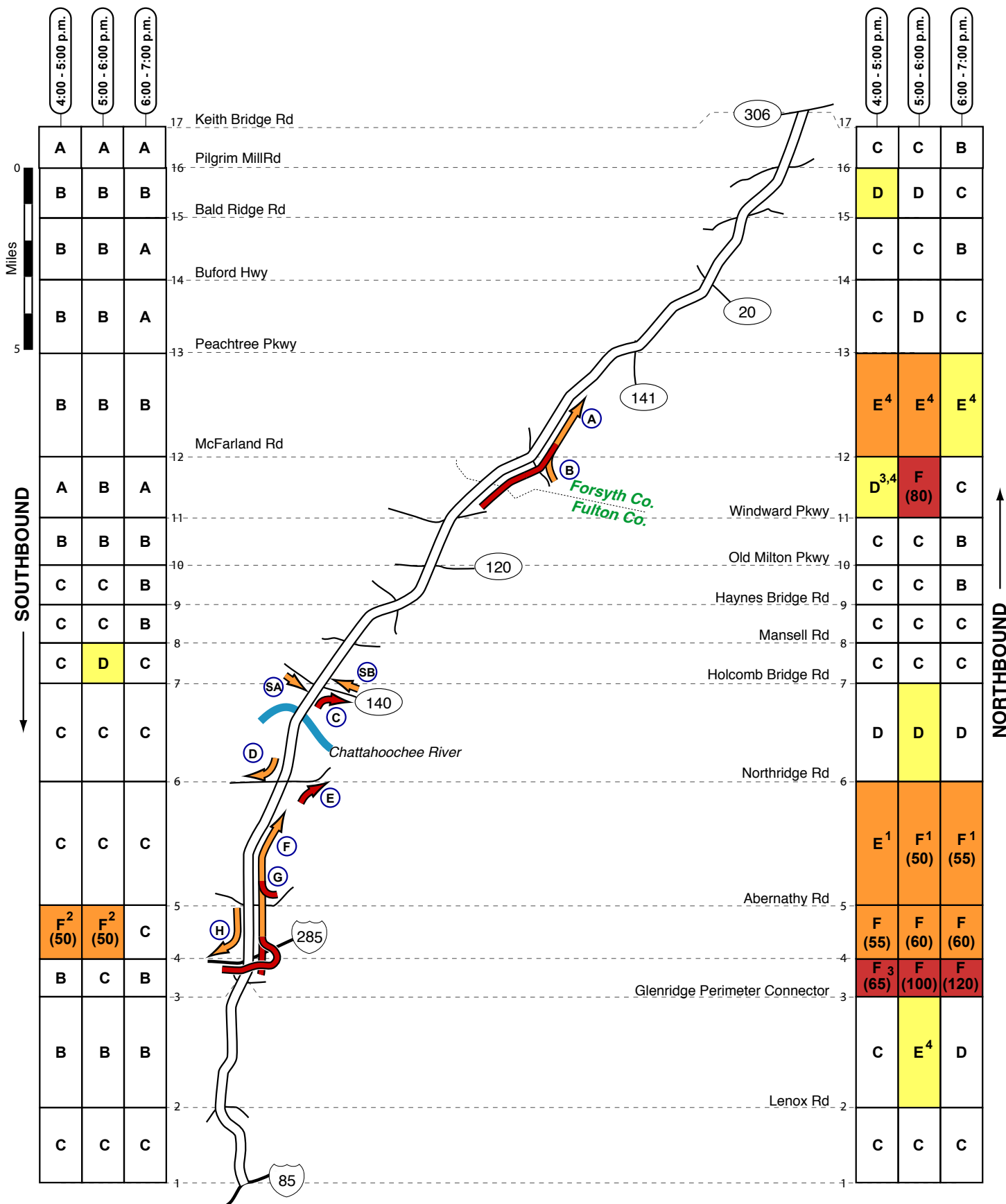
SA

Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 140
 Frequency: Most Observations
 Direction: Southbound
 Queue Population: 20 to 60 vpl
 Number of Lanes: 2
 Note: During the peak period, southbound congestion approaching SR 400 often extended back through one or more upstream signal.

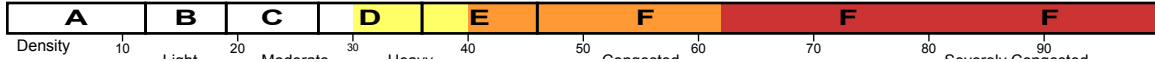
Traffic Quality Rating

A	B	C	D	E	F
Very Light	Light	Moderate	Heavy	Congested	Severe

SR 400 (Forsyth & Fulton Counties) - Evening



Traffic Quality Rating

Superscripts: ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

SR 400 (Forsyth & Fulton Counties) - Evening

A

Congestion Type: Mainline Congestion
 Frequency: Most observations before 6:30 p.m.
 Direction: Northbound
 Location: Between Windward Parkway and SR 141
 Queue Length: 4 to 5 miles
 Estimated Speed: 20 to 50 mph
 Potential Cause(s): Factors contributing to the congestion included: 1) the series of lane drops (4 lanes to 3 and 3 lanes to 2) approaching McFarland Rd and; 2) traffic entering at McFarland Rd.

B

Congestion Type: Entrance Ramp Queue
 Location: McFarland Rd
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 25 to 50 vpl
 Note: The head of the ramp queue was found where vehicles merged into the mainline on SR 400; the lane drop (2 lanes to 1) on the entrance ramp appeared to exacerbate the congestion.

C

Congestion Type: Exit Ramp Queue
 Location: Holcomb Bridge Rd
 Frequency: Most Observations
 Direction: Northbound
 Number of Lanes: 1
 Note: When congested, vehicles were queued in the right lane; vehicles at the head of the ramp waited to merge into eastbound flow on Holcomb Bridge Rd. Congestion typically extended back into the right lane of SR 400; thru-traffic on SR 400 appeared to bypass the queue without delay.

D

Congestion Type: Exit Ramp Queue
 Location: Northridge Rd
 Frequency: Most observations before 6:00 p.m.
 Direction: Southbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

E

Congestion Type: Exit Ramp Queue
 Location: Northridge Rd
 Frequency: Peak Hour
 Direction: Northbound
 Queue Population: 20 to 40 vpl
 Number of Lanes:
 Note: The head of the queue was found in the right turn lane at the head of the ramp.

F

Congestion Type: Mainline Congestion
 Frequency: Most observations
 Direction: Northbound
 Location: Between the Glenridge Perimeter Connector and Northridge Rd
 Queue Length: 5 to 6 miles
 Estimated Speed: 15 to 50 mph
 Potential Cause(s): Congestion appeared to be exacerbated by traffic entering the mainline from Glenridge Perimeter Connector, I-285 and Abernathy Rd.

G

Congestion Type: Entrance Ramp Queue
 Location: Abernathy Rd
 Frequency: Peak Hour
 Direction: Northbound
 Queue Population: 30 to 50 vpl
 Note: The head of the ramp queue was found where vehicles merged into the mainline on SR 400; the lane drop (2 lanes to 1) on the entrance ramp appeared to exacerbate the congestion.

H

Congestion Type: Mainline Congestion
 Frequency: Most observations before 6:00 p.m.
 Direction: Southbound
 Location: Between Abernathy Rd and I-285
 Queue Length: 1 to 1.5 miles
 Estimated Speed: 30 to 50 mph
 Potential Cause(s): The head of the queue was found on the ramp to I-285 (westbound); congestion typically extended back into the right (and eventually across all lanes) of SR 400.

SA

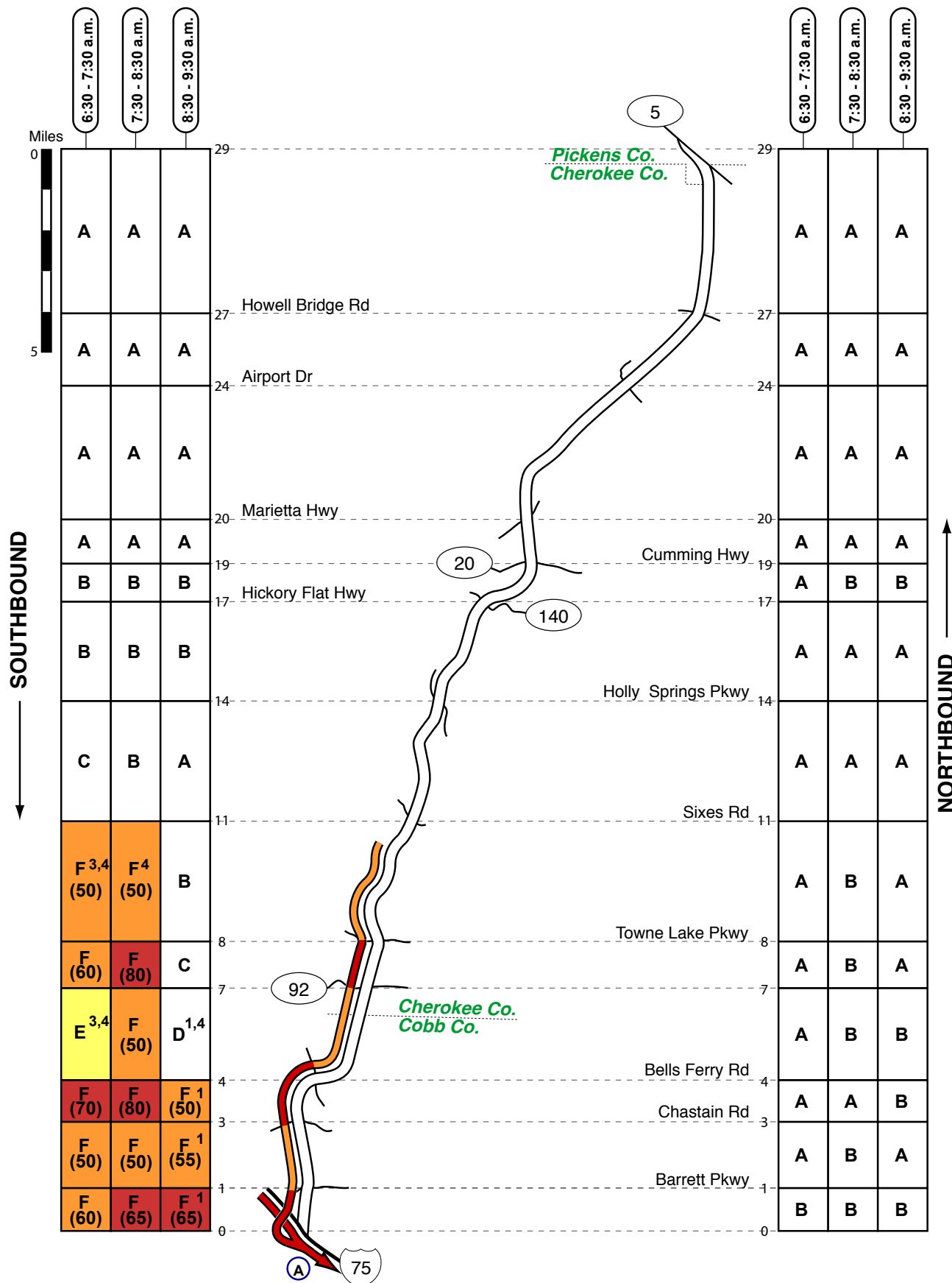
Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 140
 Frequency: Intermittent
 Direction: Northbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 3

SB

Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 140
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 40 vpl
 Number of Lanes: 2

Traffic Quality Rating

A	B	C	D	E	F
Very Light	Light	Moderate	Heavy	Congested	Severe

I-575 (Cherokee & Cobb Counties) - MorningSuperscripts: ¹ Type 1 nested congestion (some days, not others).² Type 2 nested congestion (more severe in left or right-hand lanes).³ Type 3 nested congestion (present only in the first or second half-hour period).⁴ Type 4 nested congestion (partial length of segment).

I-575 (Cherokee & Cobb Counties) - Morning

A

Congestion Type: Mainline Congestion

Frequency: Most Observations

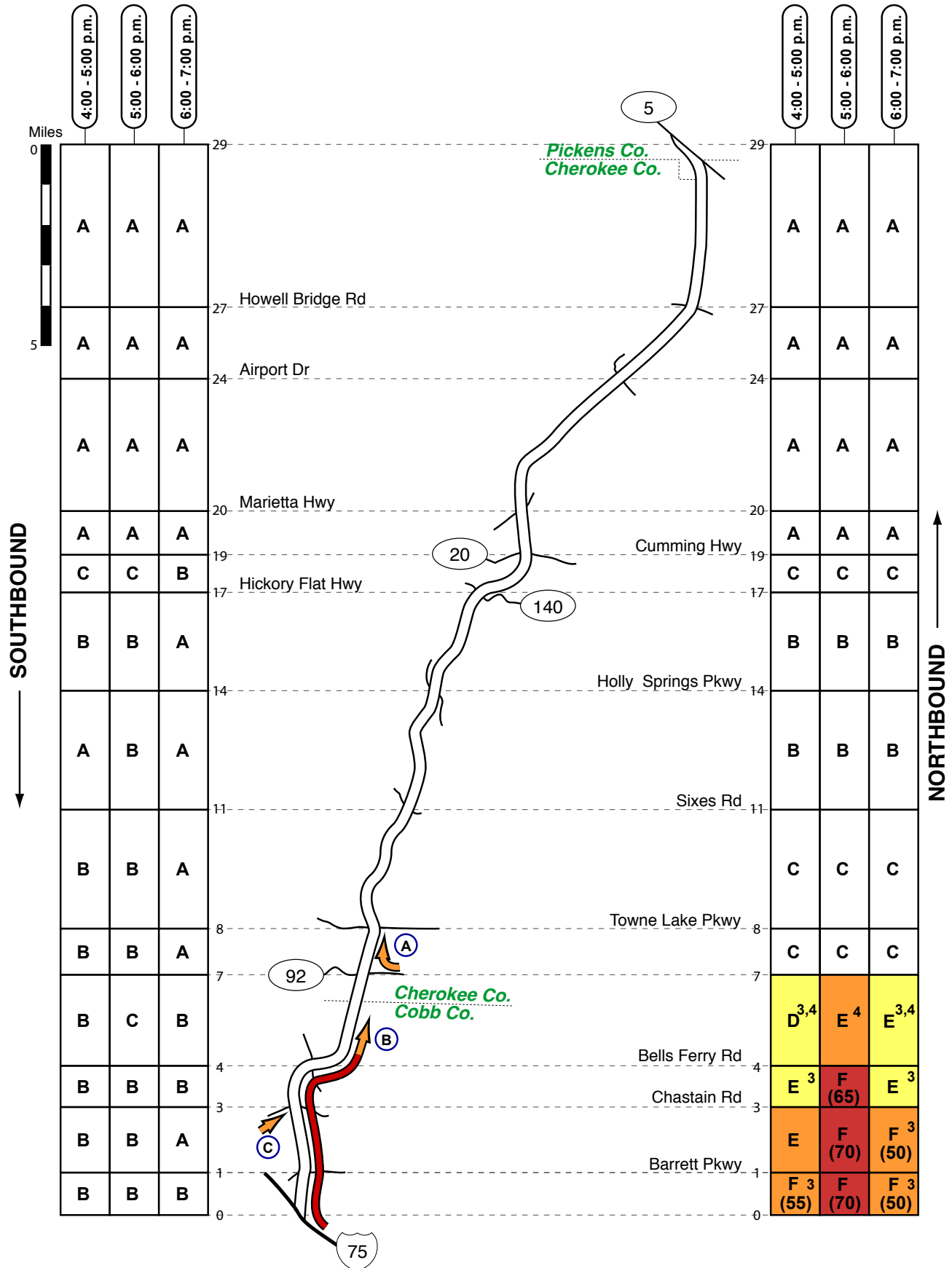
Direction: Southbound

Location: Between Sixes Rd and I-75

Queue Length: 4 to 11 miles

Estimated Speed: 20 to 50 mph

Potential Cause(s): During the peak period (7:00-8:30 a.m.), the tail of the queue on I-575 was typically found between Towne Lake Pkwy and Sixes Rd. Factors contributing to the congestion were: 1) traffic entering at the interchanges along this section of I-575 appeared to exacerbate congestion and; 2) the geometrics of the road (sharp bends).

I-575 (Cherokee & Cobb Counties) - Evening

I-575 (Cherokee & Cobb Counties) - Evening

A

Congestion Type: Entrance Ramp Queue

Location: SR 92

Frequency: Intermittent

Direction: Northbound

Queue Population: 20 to 25 vpl

Number of Lanes: 2

Note: The head of the queue was found at the ramp meter.

B

Congestion Type: Mainline Congestion

Frequency: Most Observations

Direction: Northbound

Location: Between I-75 and SR 92

Queue Length: 4 to 6 miles

Estimated Speed: 20 to 50 mph

Potential Cause(s): Factors contributing to the congestion were: 1) traffic entering at the Barrett Parkway, Chastain Rd and Bells Ferry Rd interchanges and; 2) the geometrics of the roadway (sharp bends).

C

Congestion Type: Cross Road Signal Queue

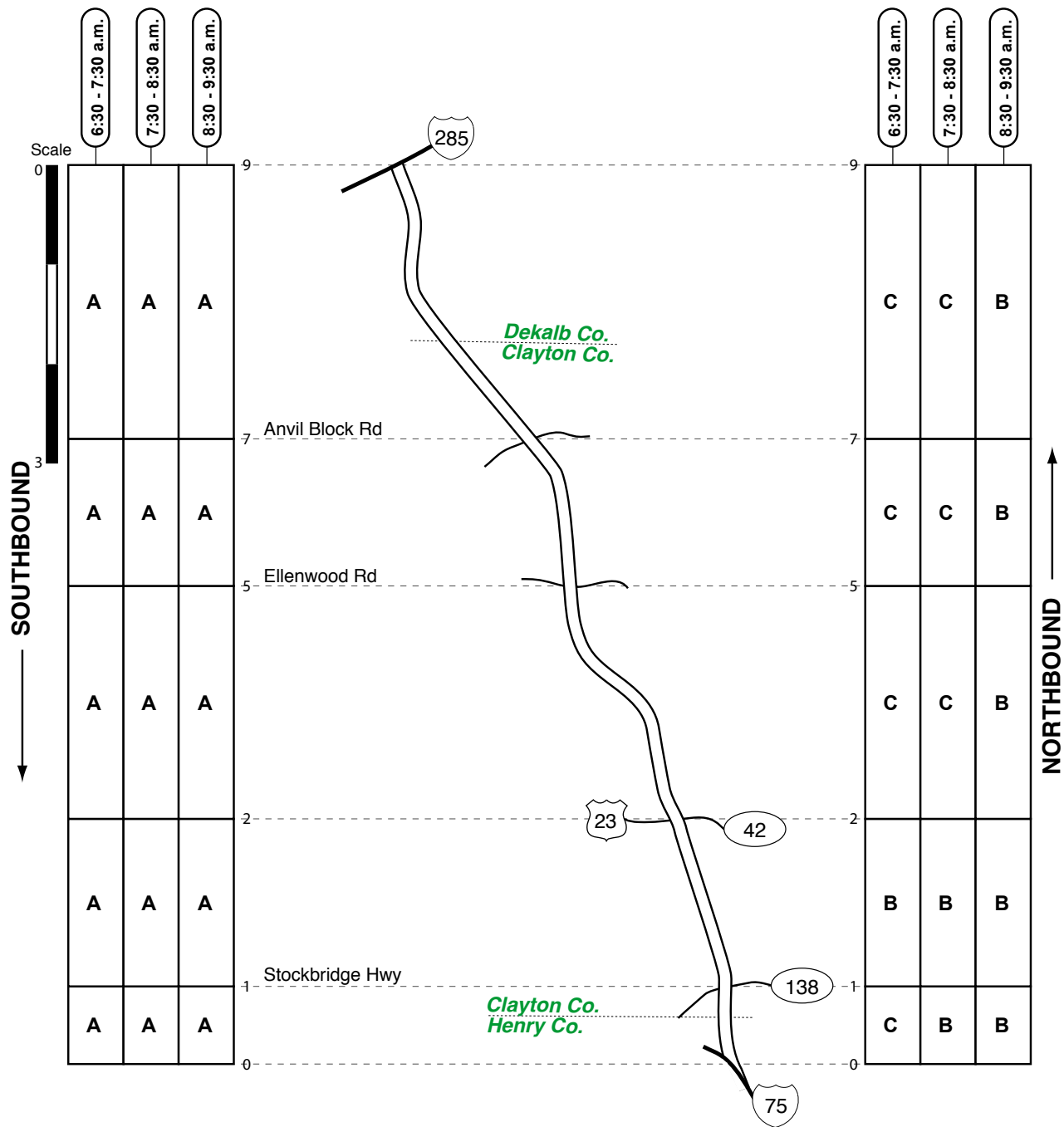
Location: Chastain Rd

Frequency: Intermittent

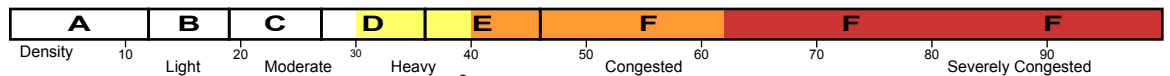
Direction: Eastbound

Queue Population: 20 to 30 vpl

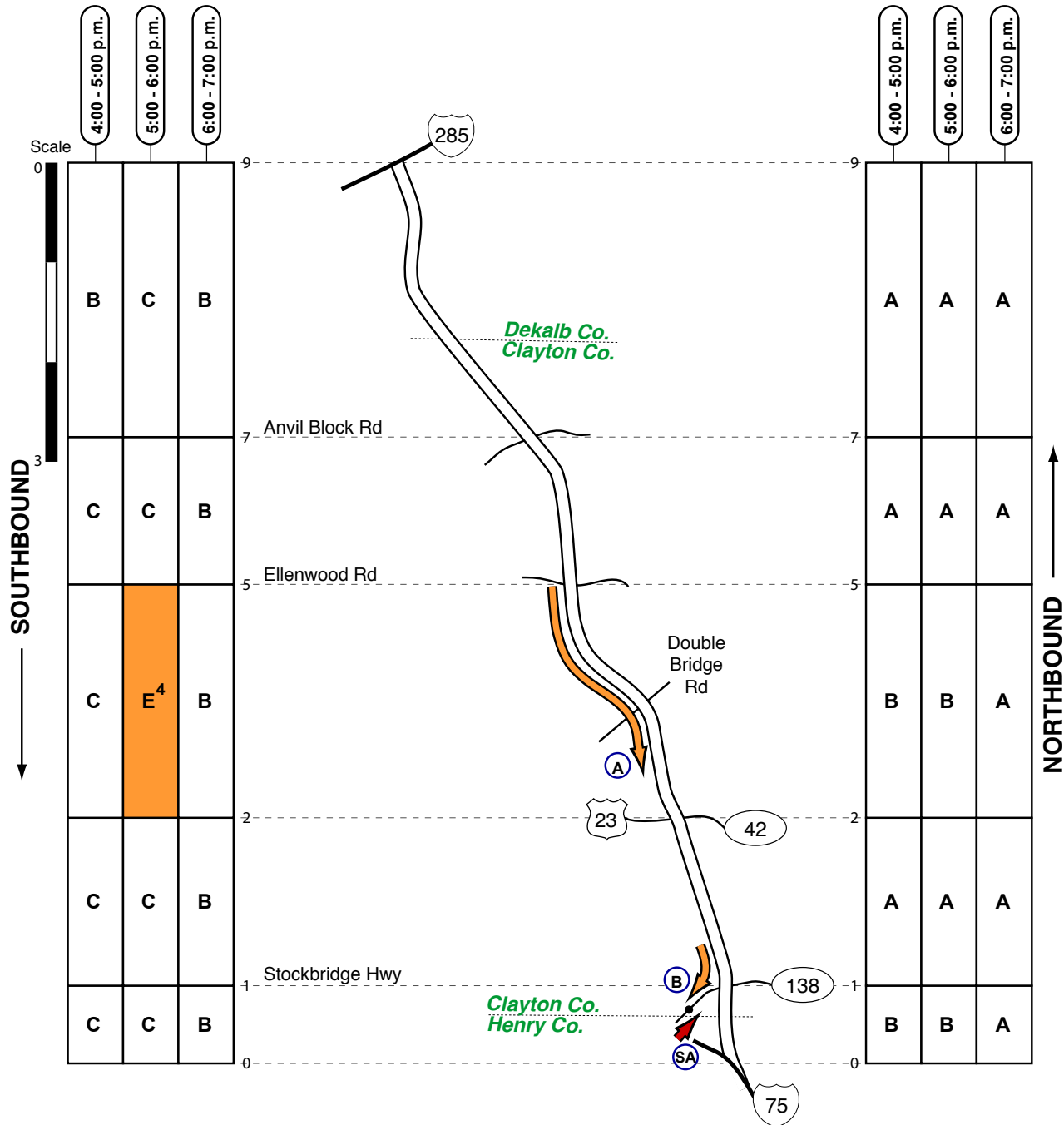
Note: The queue was found in the two left-turn lanes at the ramp to I- 575 (northbound).

I-675 (DeKalb/Clayton & Henry Counties) - Morning

Traffic Quality Rating

**Superscripts:** ¹ Type 1 nested congestion (some days, not others).³ Type 3 nested congestion (present only in the first or second half-hour period).² Type 2 nested congestion (more severe in left or right-hand lanes).⁴ Type 4 nested congestion (partial length of segment).

I-675 (DeKalb/Clayton & Henry Counties) - Evening

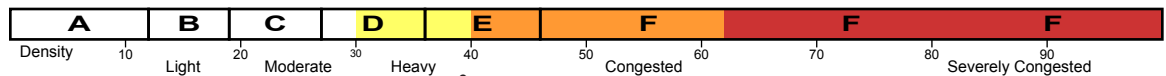


A
 Congestion Type: Mainline Congestion
 Frequency: Peak Hour
 Direction: Southbound
 Location: Between Ellenwood Rd and SR 42
 Queue Length: 1 to 2 miles
 Estimated Speed: 40 to 50 mph
 Potential Cause(s): Lane drop (3 lanes to 2) at Double Bridge Rd

B
 Congestion Type: Exit Ramp Queue
 Location: Stockbridge Hwy
 Frequency: Intermittent
 Direction: Southbound
 Queue Population: 20 to 25 vpl
 Number of Lanes: 1
 Note: When congested, the queue was found in the left-turn lane at the head of the ramp

SA
 Congestion Type: Surveyed Cross Road Signal Queue
 Location: SR 138
 Frequency: Most Observations
 Direction: Eastbound
 Queue Population: 20 to 30 vpl
 Number of Lanes: 2

Traffic Quality Rating

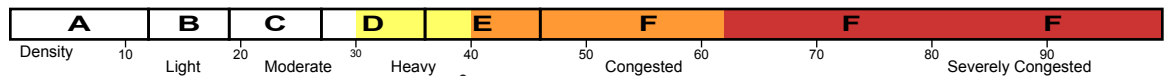
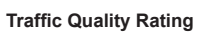


Superscripts: ¹ Type 1 nested congestion (some days, not others).

² Type 2 nested congestion (more severe in left or right-hand lanes).

³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴ Type 4 nested congestion (partial length of segment).



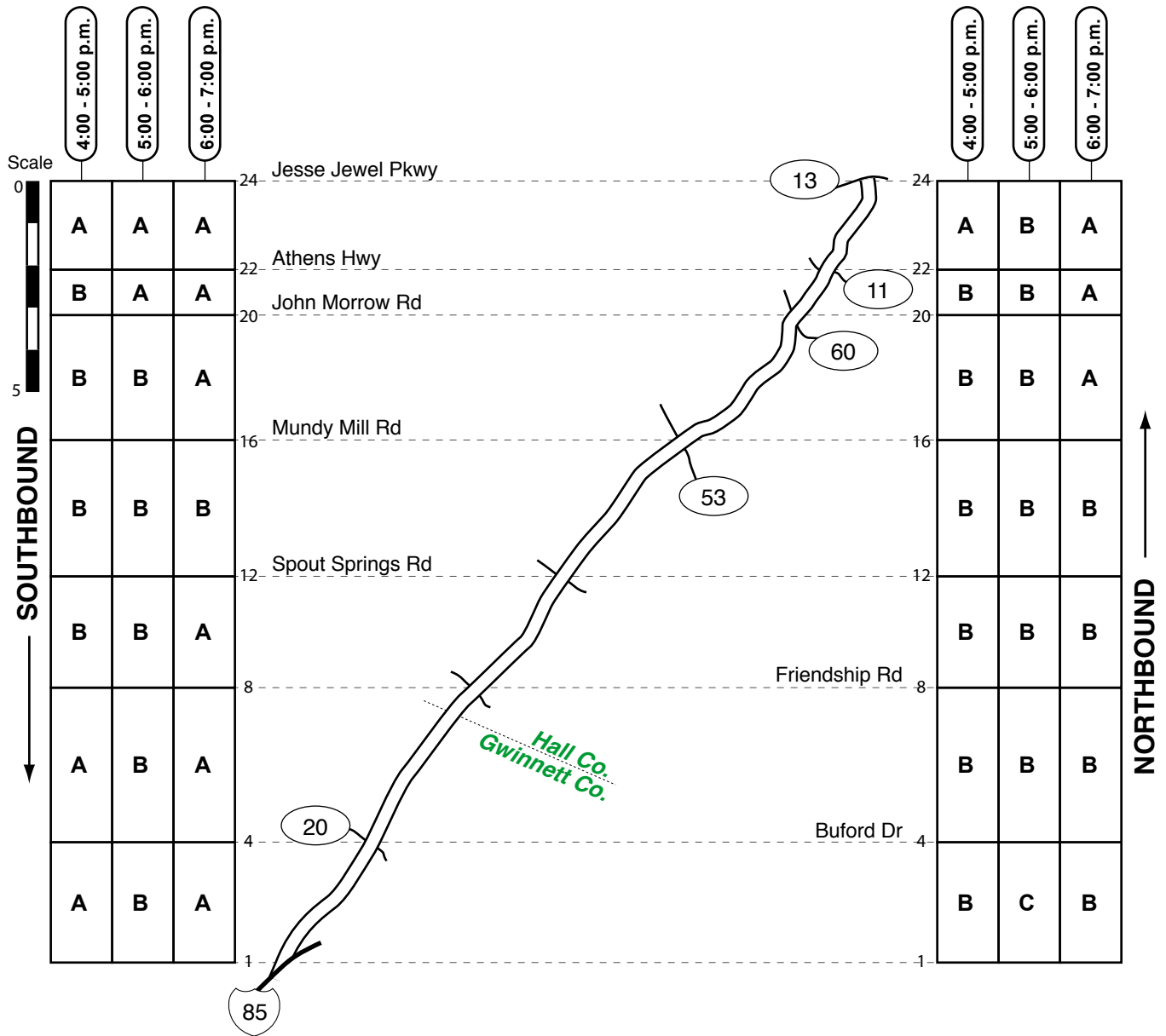
Superscripts: ¹Type 1 nested congestion (some days, not others).

²Type 2 nested congestion (more severe in left or right-hand lanes).

³ Type 3 nested congestion (present only in the first or second half-hour period).

⁴Type 4 nested congestion (partial length of segment).

I-985 (Hall & Gwinnett Counties) - Evening



Traffic Quality Rating



APPENDIX A, VOLUME ONE

PROCEDURE FOR DETERMINING FREEWAY LEVEL-OF-SERVICE

Introduction

Overlapping aerial photography can document many useful characteristics of traffic flow on highway networks. The photographs can be invaluable for screening problem sites, winning support for ideas, and explaining decisions to others. If formal rules and procedures are applied to the analysis of aerial photographs, the photography can provide a cost-effective basis for periodically rating the performance of large highway systems on a link-by-link basis.

Background

On motorized vehicle highways, traffic flow is normally measured in terms of three basic parameters: *volume*, *speed*, and *density*. These parameters are related mathematically such that, if only two are known, the third can be calculated (volume equals speed times density). Other useful flow parameters related to speed are *travel time* and *delay* between specific points on a system.

The *Highway Capacity Manual (HCM)*, updated in 2010 by the Transportation Research Board of the National Research Council, is an authoritative governmental resource that has established a simplified concept by which the performance of all types of transportation facilities can be described and compared. This concept is called *level of service*, or *LOS*. For each type of facility, a single traffic flow parameter – the one deemed most appropriate by the committee that publishes the manual – is chosen to be the basis for defining six rating categories. These categories are represented by the letters “A” through “F”, ranging from the most favorable rating of LOS A (indicating high service quality associated with lightly-used facilities) to the poorest rating of LOS F (indicating a facility burdened by congestion or other undesirable performance characteristics). This LOS system, introduced in 1965 version of the HCM and revised periodically since, has been widely adopted for evaluating existing highway systems and planning future improvements. Because six LOS classes are easier to understand than tables of numbers, LOS has been widely used in the political process. In some jurisdictions, LOS standards are even found in legislation attempting to guide facility planning or control real estate development.

Uninterrupted-flow highways (grade-separated highways without signals)

Summary

The defining parameter for HCM LOS on freeways and other uninterrupted-flow highways is the *density* of traffic flow (in units of passenger cars per lane per mile). Density was chosen as the basis for HCM LOS because, when traffic flows without interruption, traffic density relates mathematically to both speed and volume. This means that a single LOS measure based on density provides not only general speed information, but also provides an approximation of how heavily the facility is utilized. It also indicates where demand has exceeded capacity, resulting in congestion and delays. (Speed is less desirable as a defining basis for LOS because uninterrupted-flow highways can process high volumes of traffic at high speeds; ratings based on speed alone might not differentiate clearly between facilities that were heavily or lightly utilized.) The most common way to determine LOS on an existing freeway is to measure the speed and volume of the traffic, and then calculate the density. Another method is to determine density directly from aerial photographs, which allows for cost effective data collection across very large highway networks. (This also affords the other benefits of aerial photography, which often shows the underlying causes of congestion as well as conditions on interchange ramps, merges and crossroads.) Accordingly, when

Skycomp evaluates the performance of uninterrupted-flow highway facilities, Skycomp derives traffic densities from aerial photographs and then determines density-based HCM LOS ratings.

As discussed above, the LOS rating system uses the letters “A” through “F” to describe traffic conditions: LOS “A” represents superior traffic conditions (very light traffic), while LOS “F” represents poor traffic conditions (congested flow involving various degrees of delay). These letters are assigned based on how densely cars are traveling on the road. Research has shown that for all densities below 40 pcplpm, vehicles generally move at or close to normal highway speed; LOS “A” through “E” represent these densities according to the following table (pcplpm):

- LOS “A”:** densities from **zero to 11** (very light traffic);
- LOS “B”:** densities from **12 to 18** (light to moderate traffic);
- LOS “C”:** densities from **19 to 26** (moderate traffic);
- LOS “D”:** densities from **27 to 35** (moderate to heavy traffic);
- LOS “E”:** densities from **36 to approx. 45** (heavy traffic, but still at speeds close to free-flow)

At densities greater than **40**, speeds typically decrease and traveler delays are incurred. Because flow at all densities greater than **46** (approximately) are regarded as LOS “F”, this report attaches actual densities to all LOS “F” ratings. Accordingly:

- LOS “F”:**
- Densities from **46 to 60** indicate delay involving minor degrees of slowing; average speeds usually range between 50 and 30 mph;
 - Densities from **60 to 80** indicate traffic flow at average speeds usually ranging between 40 and 15 mph;
 - Densities from **80 to 100** indicate congested traffic flow, with some stopping possible; average speeds usually range between 10 and 25 mph;
 - Densities above **100** indicate severe congestion, with considerable stop-and-go flow likely. For reference, densities above 120 almost always indicate the presence of unusual events (accidents, roadwork, etc.). The practical maximum value for density measurements is **180**; the theoretical maximum value is **264** (at 20 feet per vehicle).

Data Reduction Procedures

From overlapping time-stamped photographs, densities by highway segment were determined by manual counts taken along the entire segment length. Vehicles were classified as cars, trucks, buses, or tractor-trailers when counted; later, passenger-car equivalents (pce’s) were derived according to the following table:

<u>Vehicle type:</u>	<u>PCE’s:</u>
cars	1
buses	1.5
trucks	1.5
tractor-trailers	2.0

Data that were atypical due to roadwork or to known or suspected incidents were coded for exclusion from the averaging process. All data were then entered into a microcomputer database program, which performed the following tasks: 1) samples were grouped by time slice; 2) average densities were calculated; and 3) densities were converted into service levels “A” through “F”. The computer then prepared matrices showing each averaged service level rating plotted by time and highway segment. These data matrices were then copied into

the traffic quality tables, which are provided in this report.

In the tables, all LOS F conditions (congested traffic flow) have been darkly shaded; this permits quick identification of locations experiencing demand at levels exceeding capacity. Because LOS “F” encompasses a wide range of densities, the actual density values are entered next to the “F”; using the travel characteristics in the density ranges provided above, the nature of the flow in LOS F segments can be determined.

While examining the photography, analysts also identified side streets and on/off ramps that were congested. Where these problems were recurring, descriptive narratives were prepared.

Note regarding nested congestion:

While examining the photography, analysts also identified a condition known as “nested congestion”. This occurs where density values calculated by the procedures described above do not reflect all of the congestion that was present in the photography. This happens because density values are averages, and where segments are only partly congested – for example, only traffic in the right lane is congested – the count of all vehicles in all lanes produces a density value that is below the threshold for “congestion”. In effect, counts from non-congested travel lanes “dilute” the counts from congested lanes. Actually, congestion can vary within a specific segment in one of four basic ways; therefore, four types of nested congestion are routinely identified:

Type 1: a segment is congested on some survey dates but not others;

Type 2: congestion is found in some travel lanes but not others;

Type 3: congestion is consistently found in just one 30-minute half of a given one-hour time slice (say from 5:00 to 5:30 p.m. when the average density value reflects 5:00 to 6:00 p.m.);

Type 4: congestion extends only for part of the length of a segment.

Because this is a macro-level survey program, the procedure is to produce one mathematically-derived performance rating per segment per hour per direction, for thousands of surveyed segments. Our analysis is limited to identifying locations where nested congestion was found, using a superscript to identify Types 1, 2, 3 and/or 4. Those superscripts can be found throughout the tables of this report.

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APPENDIX B

METHODOLOGY DESCRIPTION

Procedures for obtaining speed/density samples for calibration of
the Van Aerde Speed / Density Model

BACKGROUND

In the spring of 1995, Skycomp collected data to compare the speed of vehicles through congested freeway zones with corresponding densities obtained from aerial photographs. The purpose was to explore the relationship between the two, and, given a reasonable correlation, to prepare a model by which vehicle speeds could be estimated from aerial density photographs.

The program was conceived and executed by the Metropolitan Washington (D.C.) Council of Governments (MWCOC). Aerial data were collected by Skycomp; analysis of the data and calibration of the Van Aerde speed/density model were conducted by MWCOC (draft paper included in this appendix).

A secondary objective was to evaluate the accuracy of aerial speed and density measurements by comparing them to data collected by traditional methods (floating cars and loop detectors embedded in the pavement).

Accordingly, segments of freeway were chosen to be surveyed that: 1) were expected to generate congested traffic flow; and 2) either contained a loop detector station or would accommodate quick turnarounds for multiple floating car runs. Thus, while data were being collected in the air (290 speed samples were obtained from the air, along with corresponding densities), loop detector or floating car data were collected concurrently on the ground.

The outcome of this study was a finding that travel speeds across congested freeway segments could be determined with reasonable accuracy using only aerial density photographs. It was also found that speeds and densities obtained through aerial techniques closely matched data obtained using the traditional ground methods.

PROCEDURES TO OBTAIN SPEED / DENSITY SAMPLES:

The observer/photographer followed the following procedure to obtain all speed/density samples: he first flew along the selected survey segment while taking time-stamped overlapping density photographs of the entire segment; next, at the upstream end, he selected a target “floating” car for tracking; he photographed the target as it entered and departed the segment, while simultaneously timing its run to the nearest second. He then took an “after” density photo set; and then recorded the following information on a clipboard: the time of the sample, the target vehicle description, lane(s) traveled, elapsed time, and any special notes. This procedure was repeated for each speed/density data point.

In the actual course of sampling, this procedure was modified in several ways. First, where cars were moving at high (free-flow) speeds, the density did not change significantly between samples; thus sometimes three or more floating cars were timed between density runs.

Another modification done in-flight is as follows: the observer noted in several cases that the density set taken before the target vehicle went through better reflected the conditions the car encountered than the density set taken after the vehicle went through (or vice versa). This was usually due to a delay in changing film, extra maneuvering the airplane, or any other event which delayed the “after” density sample for several minutes after the completion of the run. While normally the density associated with each speed sample was an average of the “before” and “after” density sets, in these cases only the “before” or “after” density set would be used (as directed by the observer).

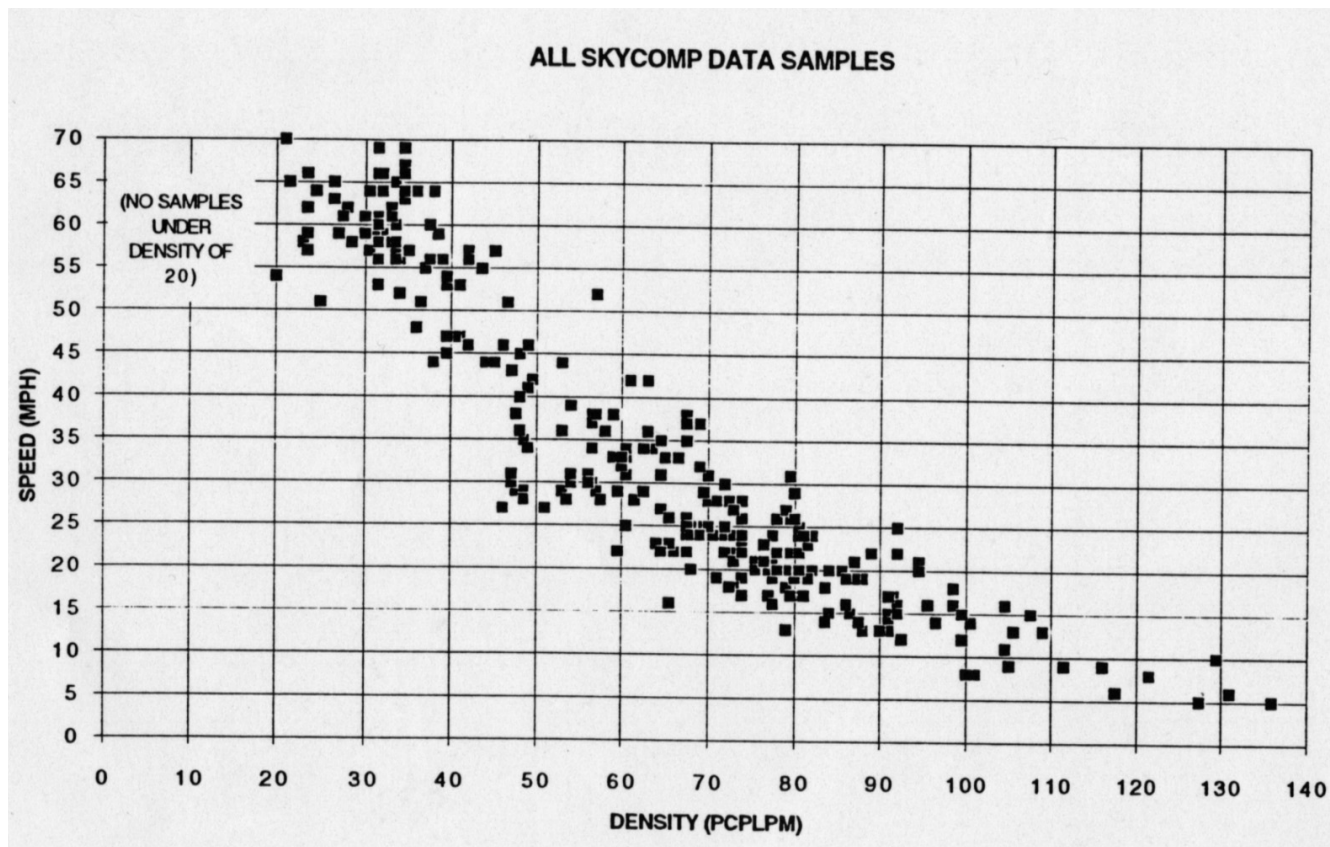
With regard to selection of target vehicles, the plan was to select cars that reflected the average speed of traffic, just as floating car drivers are instructed to approximate the speed of traffic flow. Fortunately, vehicles have little freedom to choose their speeds in the congested density ranges (above 40 pcplpm). So, for example, almost any vehicle in a congested traffic stream in the middle lane of three will give a suitable floating car measurement. Even tractor-trailers (unless heavily loaded and traveling uphill) moved at the same speed as passenger cars. Thus the criteria the observer used in selecting each target vehicle was 1) is it in the correct lane; and 2) does the vehicle stand out so that it is easy to keep track of?

Also, in the event that the highway had four travel lanes in one direction, alternating samples were taken from both middle lanes.

In the event that a driver switched lanes while being tracked, the observer noted the lane change and also noted which lane the car spent the majority of time in (this is the lane for which a density count would be made later). In several cases (infrequently), the observer abandoned tracking certain vehicles when: 1) the driver made multiple lane changes, trying to beat the average speed of traffic; 2) the driver switched lanes and changed speeds obviously and significantly; 3) the vehicle turned out to be a heavily loaded truck which delayed the traffic stream; or 4) the observer “lost” the vehicle being tracked. Also, for the samples made with traffic traveling at free-flow speeds, vehicles were abandoned which proved to be traveling significantly faster or slower than the average speed of traffic.

In the event that the target vehicle moved to the right lane in apparent preparation to exit, the observer often was able to switch tracking to another vehicle that had been just behind or ahead of the original vehicle in the same lane (and used the newly adopted vehicle to complete the sample). This was necessary because in some cases six or seven minutes had been invested in the tracking of a specific vehicle, and it was important to avoid wasting that time where possible.

It should also be pointed out that speeds were not tracked for very slow moving queues (densities over 120 / MWCOG samples only). Instead, density runs were made at 5 or 10 minute intervals, such that later on the ground the same vehicles could be found in succeeding sets of density photos; this allowed computation of speeds and associated densities.



DATA PROCESSING

After each flight, a topographic map was prepared for each zone which showed the starting and stopping points for each tracked car. Measurements were then made of the segment length (distance traveled). Then each tracked vehicle was entered into the computer database, including:

1. vehicle description
2. time-of-day
3. initial lane and subsequent lane changes
4. precise travel time (from stopwatch or time-lapse photographs)
5. density-photo preference, if any (default was to average the before- and after- density samples)
6. any special notes pertaining to that vehicle.

After the photos had been processed, each set of overlapping “density” photographs was taped together into a “mosaic” that showed each entire segment. Then vehicles in the required lane(s) were counted, listed by “car”, “truck”, “tractor-trailer” and “bus”. These totals were translated into passenger-car equivalents (PCE’s) using the following values:

<u>Vehicle type:</u>	<u>PCE’s:</u>
cars	1
trucks	1.5
tractor-trailers	2.0
buses	1.5

(It should be noted that the distinction between “cars” and “trucks” could not be cleanly made, since there are many varieties of light and heavy pick-ups (both covered and uncovered). In general, a pick-up or van had to be at least twice the size of an average-sized car to be considered a “truck”.)

PCE’s were then divided by segment length to calculate densities. These density samples were then matched to corresponding speed samples; each speed/density data pair was then plotted on the chart.

CALIBRATION OF THE VAN AERDE MODEL

Van Aerde Model DRAFT -- 15 Feb 96

The main advantages to a single-regime model are that boundaries between regimes do not have to be defined; and curves from adjacent regimes do not have to be spliced at the boundaries. A single-regime model allows for a more subjective and repeatable calibration process. This will be especially true if more data from the high-speed end of the curve is ever incorporated into this process.

The disadvantages to this particular model are that it expresses this project's independent variable as a function of the dependent variable; and that it is a non-linear function. These disadvantages make performing the initial calibration more difficult. However, once SAS programs for the task are written, they can be used again usually with a minimum of effort.

The procedure for calibration was as follows: 1) The model's equation was coded into a spreadsheet so that the shape could be defined by recognizable parameters: two points that the curve passes through, the free-flow speed, and the speed at capacity. By overlaying this curve with the scatter plot of the observations, initial estimates of the parameters were made. 2) The initial parameter estimates, the equation, and the observations were used in a SAS PROC NLIN job to machine-calibrate the parameter estimates. 3) A second SAS program translated the calibrated equation into a look-up table that expresses speed as a function of density. 4) The results of the SAS work were imported into a spreadsheet for plotting and for calculation of prediction intervals.

Two outstanding technical issues related to this procedure are determination of the free-flow speed, and calculation of prediction intervals.

The free-flow speed for best fit can be determined by the PROC NLIN program, as are all other parameters. Due to the lack of data at the low-density region of the model, PROC NLIN returns a very high free-flow speed. Additional data from MD SHA was used to calculate a free-flow speed for general application on the Beltway. The calibration of the model presented here resulted from forcing the free-flow speed to match the SHA data analysis.

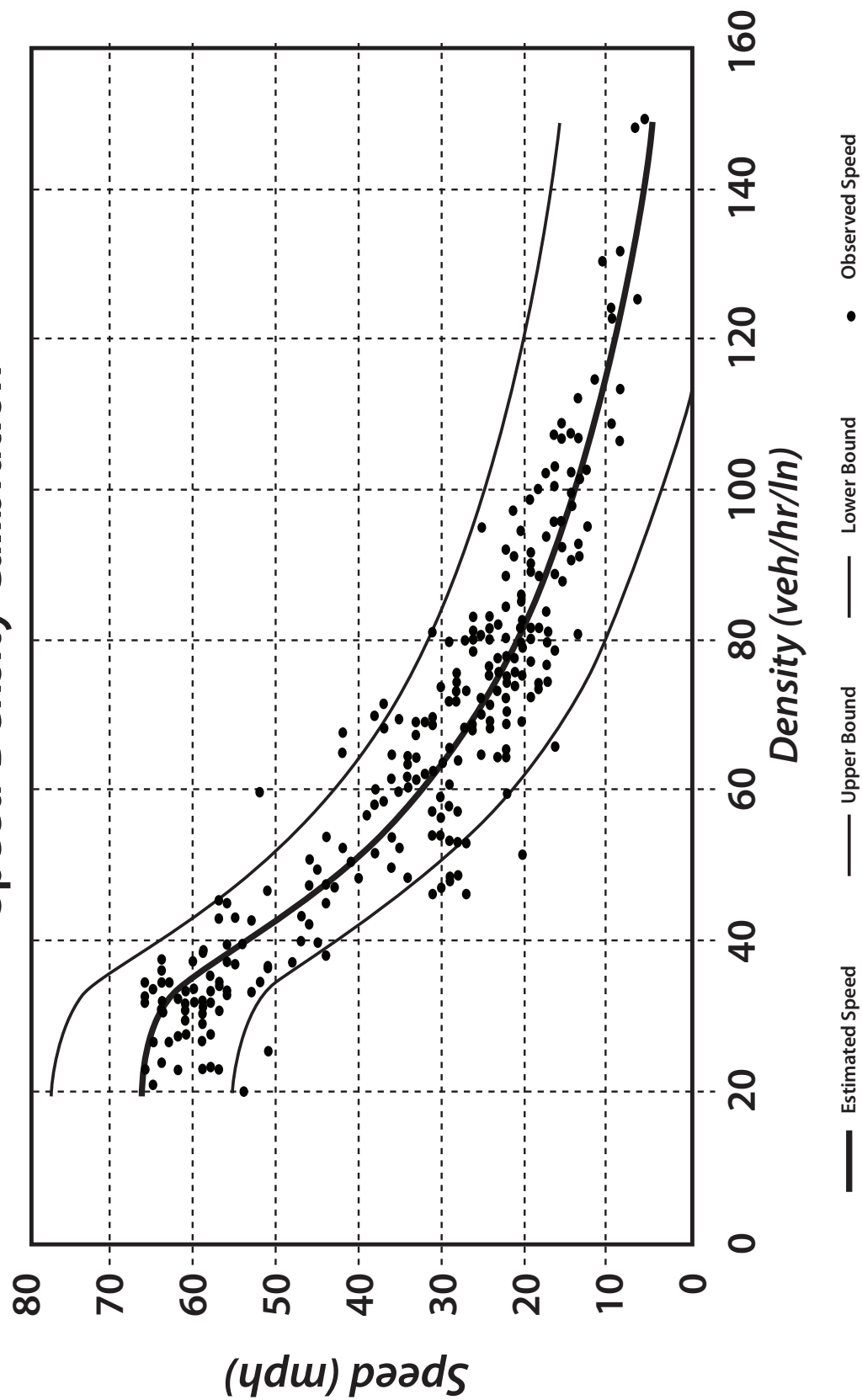
The prediction intervals shown in the current plot were calculated after the model was translated. This may have not been appropriate. PROC NLIN calculates prediction intervals directly as it calibrates the model. Those prediction intervals express density as a function of speed, however. Work is in progress to translate them, and to otherwise arrive at the most appropriate method of determining prediction intervals. Since a single-regime model is more suitable in a computerized process, and for lack of significant difference in performance, the Van Aerde model is preferred over earlier approaches examined by MWCOG staff and presented before subcommittees.

Speed-Density Calibration
Van Aerde Single Regime Model

free-flow spd = 67 mph / c1 = 0.00512 / c2 = 0.0114 / c3 = 0.000342

	DENSITY (veh/ln/mi)	SPEED (mph)	VOLUME (veh/ln/hr)		DENSITY (veh/ln/mi)	SPEED (mph)	VOLUME (veh/ln/hr)
free-flow	0	67.0	0				
	20	66.4	1,328		80	20.7	1655
	25	65.8	1,661		85	18.6	1580
	30	64.6	1,946		90	16.7	1503
capacity	35	61.3	2,144		95	15.0	1425
	39	55.8	2,190		100	13.5	1350
	40	54.7	2,189		105	12.1	1271
	45	47.8	2,153		110	10.9	1197
	50	41.9	2,094		115	9.7	1117
	55	36.8	2,025		120	8.7	1043
	60	32.6	1,954		125	7.7	963
	65	28.9	1,880		130	6.8	885
	70	25.8	1,806		135	6.0	810
	75	23.1	1,731		140	5.2	729
					187	0	0 jam

Van Aerde Single Regime Model Speed-Density Calibration



Van Aerde Single Regime Model

